LOUISIANA Conservationist

March/April 1989

$1.50

Virginia Van Sickle

Comments

Thanks for bearing with us in a sticky situation. If you missed the last issue, we'll see that you get one. Just ask.

Some Louisiana Conservationist readers failed to receive the January/February issue. The trouble was that the printer had used the wrong kind of adhesive on the address labels. Quite a few didn't stick to the new-type glossy board cover we're so proud of, and the Post Office couldn't deliver them.

We expected a lot of angry letters. We did get a lot of letters, but mostly they were friendly and understanding. Many of you took the time to talk to your local postmaster, learn the nature of the problem and then write to us with suggestions. We are grateful to you for your concern.

The problem has now been remedied, and the printer assures us it won't happen again. Right now, though, we're not sure just who got our magazine and who didn't. Luckily, we have an extra supply of the January/February edition on hand, and we'll gladly send a copy if you contact us.

Louisiana Conservationist
(ISSN 0024-6778)
Volume 41, No. 2
Baton Rouge, LA 70808

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The Louisiana Conservationist is published bimonthy by the Louisiana Department of Wildlife and Fisheries, 2000 Quail Drive, Baton Rouge, LA 70808. Telephone number is (504) 765-2918. Second-class postage paid at Baton Rouge, Louisiana and additional mailing offices. Postmaster: Send address changes to Louisiana Conservationist, P.O. Box 98000, Baton Rouge, LA 70898.

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LOUISIANA Conservationist

Published by the Department of Wildlife and Fisheries in the interest of conservation of Louisiana natural resources.

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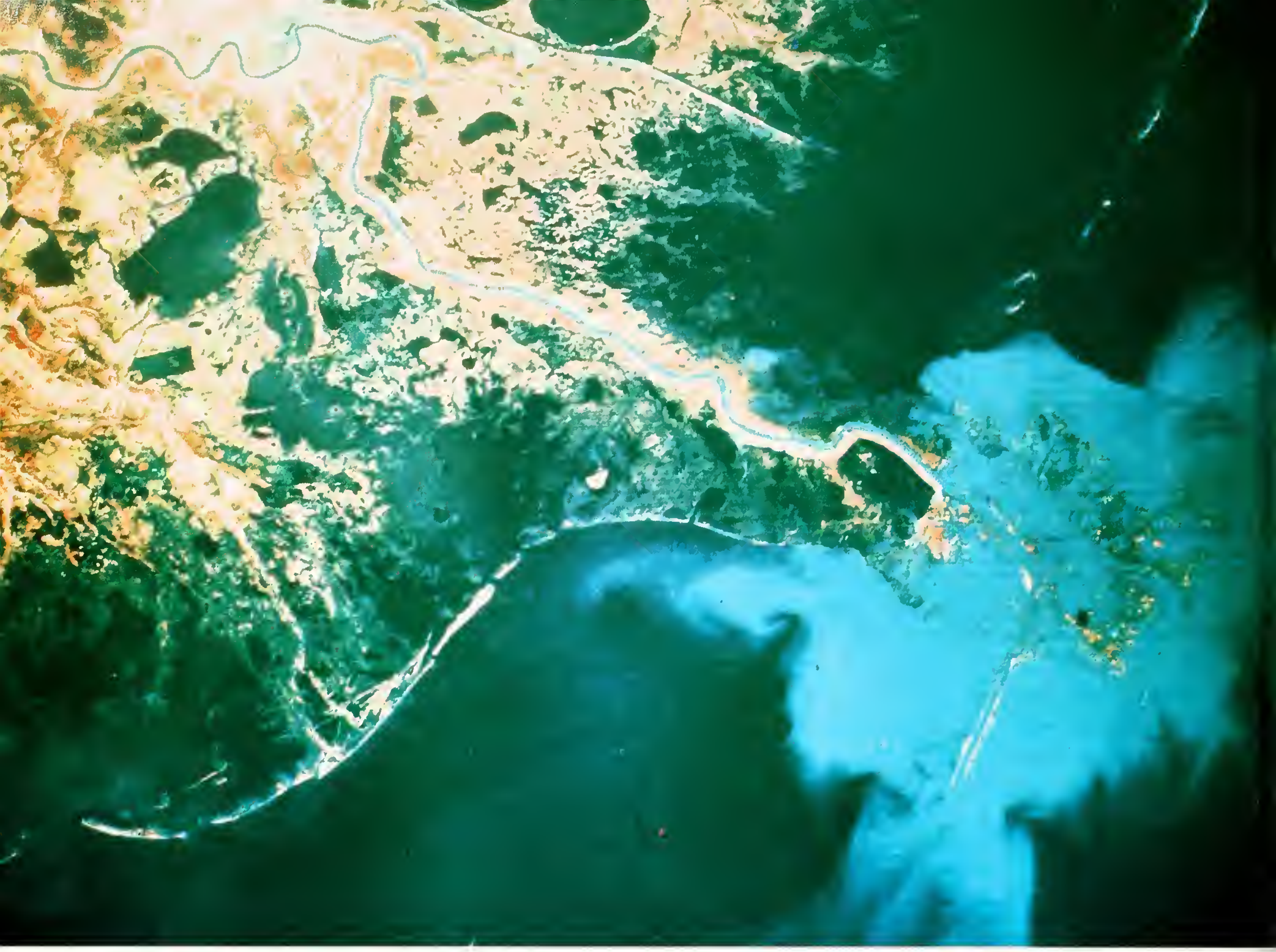


Leeves built along the Mississippi River as flood control measures warped the river's natural land building process. Instead of continuously building wetland mass and offsetting subsidence, the river now heaves precious sediment from two-thirds of the continent into the deep waters of the Gulf.

Doing the
Unthinkable

BY SARA ANN HARRIS

Coastal land loss in Louisiana is catastrophic, the report by the new Governor's Coastal Restoration Committee opens. This strong language expresses exactly the approach that the committee means to take — bold. Estimates are that up to sixty square miles of the state's nutrient rich coastal wetlands disappear every year — that is a startling loss of nearly one acre every ten minutes. It is not a new problem. But the approach to solving this dilemma of gargantuan proportions, affecting the nation's major drainage basin, is. It's muscular. It's directed. It is the first of its kind — a multi-agency effort that reports expressly to the chief executive with detailed technical solutions to a problem that has stumped decision makers and resource managers for decades.

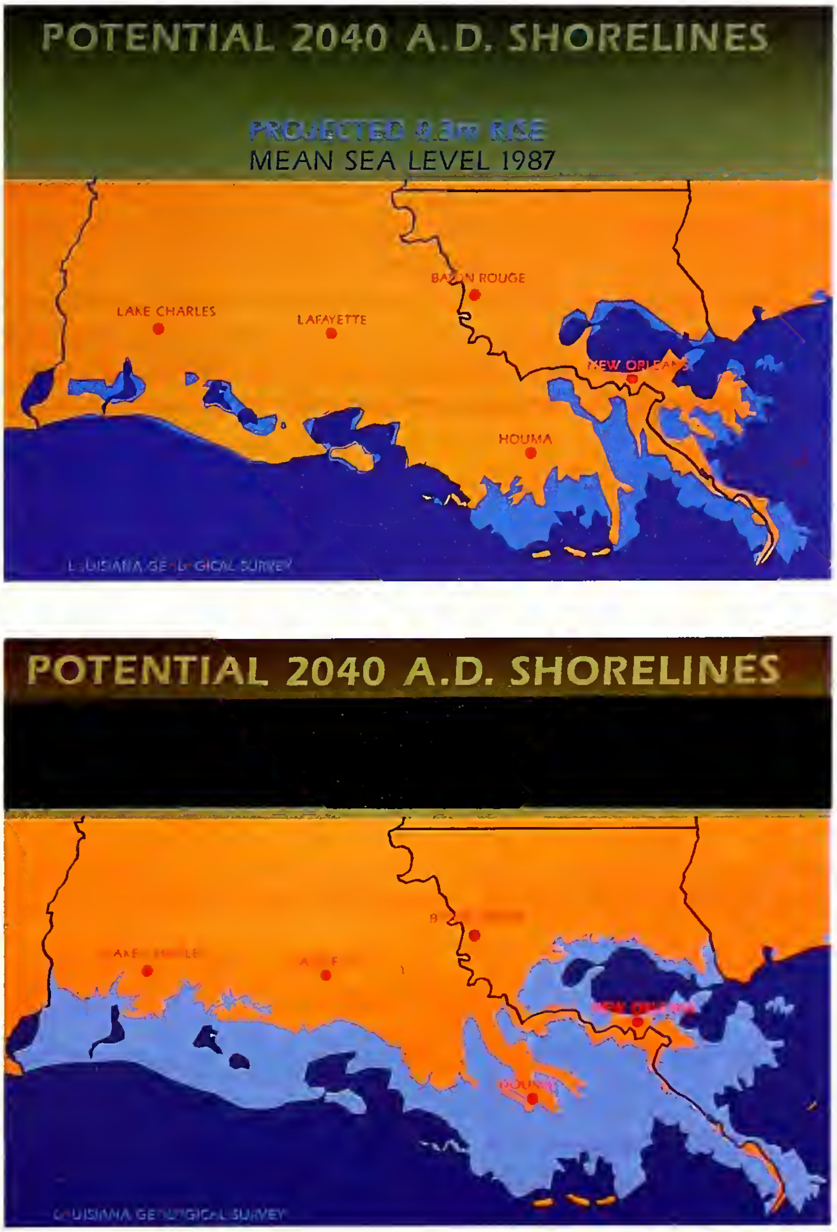
Past initiatives to address land loss on the Louisiana coast, both citizen and institutional, have met with the same demise. They lost ground rapidly due to lack of leadership or unified effort. State agency projects, for example, always working independent of one another have been repeatedly stared down by (1) the complexity of negotiating the interests of big league players like navigation, oil and gas exploration, commerce and flood control and (2) the task of defining a source of funding in the billions of dollars. A concerted effort is the winning ticket for Louisiana's coast. And the governor has pulled together experts from the responsible state agencies to work on just that. While they are keenly aware that each competing interest in the resource base is an important piece in the puzzle, for the first time this committee has taken the bull by the horns and elevated coastal preservation to a new status.

Put in place at the sole initiative of Governor Buddy Roemer and comprised of policymakers from the departments of wildlife and fisheries, natural resources, environmental quality, transportation and development, agriculture, the LSU Center for Wetland Resources and the governor's staff, the policy committee in three months time submitted to the governor basin by basin recommendations prepared by the leading technicians in the state. "It is a working document compiling and coordinating a suggested course of action from the singular viewpoint of coastal restoration and protection...This is a bold approach, not shy nor afraid," the introduction reads. "Stewardship of the state's coastal wetlands is elevated to a level of attention and tangible action commensurate with that historically reserved for navigation, flood control and irrigation."

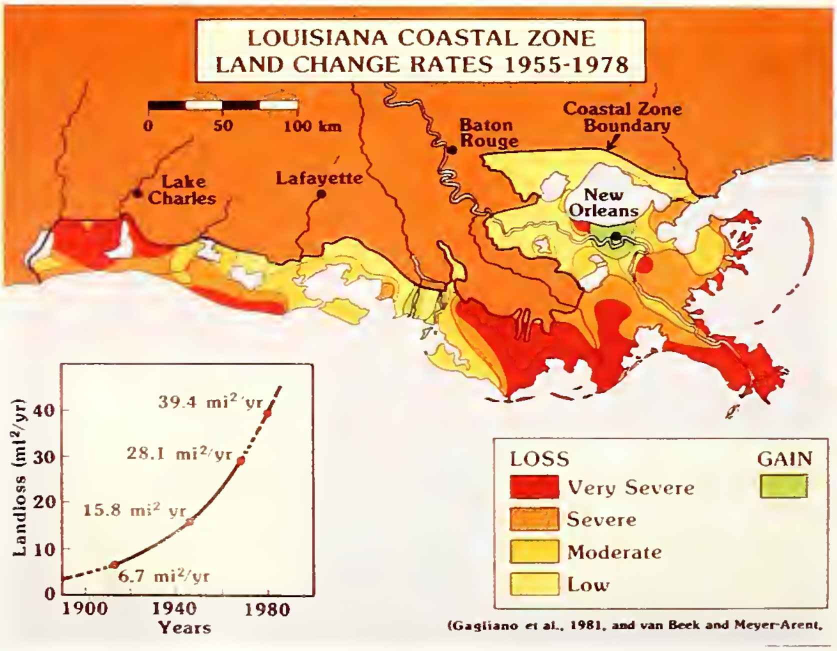
The job of changing the very course of massive deterioration of wetlands is inextricably tied to complex negotiations with the U.S. Army Corps of Engineers. Because customarily state agencies have approached the Corps independent of one another, their statements have often overlapped or were even contradictory. Bob Misso, assistant secretary of the Louisiana Department of Wildlife and Fisheries and committee member, clarified: "The Corps of Engineers will have to play an integral role; it's their projects that we are going to be changing. We found that the state was speaking through a variety of voices to them. The Corps was not hearing one concerted strong state position. This greatly diminished any chance that anyone's recommendations were ever going to be paid any attention to. Basically, unless the state could pull together and speak with one voice it was felt that for another twenty years we would see the same thing we've had for the past twenty years: erosion, erosion and not a whole lot of federal help."

In addition to pooling our resources to focus on the giant task and coordinating so as to become effective in the state's dealings with other bodies, speaking in a single voice would put Louisiana in a posture to apply for federal assistance. "We recognize we have a monumental problem plus we're a state that has no money," Misso said. "If there is an answer it's a multi-billion dollar answer and it's going to

Indicated below (top) is the projected land loss by the year 2040 as caused by manmade channels and conversion of wetlands for development and agriculture. Contrast this with the projected loss by that same year (bottom) as caused by a rise in sea level of 1.5 meters brought on as the earth's surface warms and polar ice caps melt.


POTENTIAL 2040 A.D. SHORELINES
PROJECTED 0.3m RISE
MEAN SEA LEVEL 1987
BATON ROUGE
LAKE CHARLES
LAFAYETTE
NEW ORLEANS
HOUMA
LOUISIANA GEOLOGICAL SURVEY
POTENTIAL 2040 A.D. SHORELINES
LOUISIANA GEOLOGICAL SURVEY

Habitat loss immediately impacts wildlife species. The list of marsh animals is lengthy. It includes furbearers like muskrat (top left) and nutria (top right), and alligator (right). From 1955-1978 Louisiana's southeast coast in particular (bottom) has experienced dramatic loss, as indicated by the dark red. Notice the contrast with the minimal land gain over the same period (green).



(Gagliano et al., 1981, and van Beek and Meyer-Arent,

come with heavy Washington influence. We recognize that we have a bear by the tail.

"The ultimate conflict is that those folks who are not willing to consider coastal restoration because it may have an adverse impact on them at a particular place or at this point in time — those people who are not thinking about the future — may so divide public opinion that it deflates any concerted effort by Louisiana. If we've got folks squabbling, if we've got a 50-50 standoff down here, how can we realistically expect our congressional delegation to stand up, wave our banner and charge ahead to convince Congress to send us a couple of billion dollars?"

The world's greatest and most productive delta is in Louisiana. The Mississippi River has run through the heartland of the country for centuries building land mass at the delta with sediment from 2/3 of the continent. Grasses and other plant life stabilize the mudflats to create expansive marshlands that support communities of nutria, muskrat, raccoon, mink, otter, shorebirds and wading birds. Louisiana marshes are the most valuable wintering habitat for waterfowl on the continent.

Additionally, they support multimillion dollar renewable resource industries. Consider these facts: a commercial fish and shellfish harvest valued at $680 million annually or 40% of the nation's fisheries; a seafood industry employing 40,000 people; a fur industry of 2,000,000 fur pelts valued at $25 million; crawfish harvest from the Atchafalaya Basin valued at $12.1 million; alligator harvest from Louisiana's marshes valued at $2.6 million; habitat for 66% of the nation's migratory waterfowl; waterfowl hunting valued at $58 million annually; hunting, fishing and other water-related recreation with expenditures exceeding $337 million annually and enjoyed by 27% of Louisiana's population.

Manmade forces are causing a cessation of the land building process. The problem is progressive and accelerating. The battle between the sea and every great river is as old as the earth itself but our manipulation of waterflow has heated the battleground. Saltwater intrusion by the Gulf of Mexico causes deterioration of wetlands when vegetated materials intolerant to saltwater are killed and land mass becomes open water. The dredging of navigational canals and ship channels rips open the bowels of the coast allowing the Gulf deeper entrance.

In the tug of war between river and sea, the sea has been another advantage. The warming of the earth's surface is melting polar ice caps and causing a rise in sea level worldwide.

The harnessing of the Mississippi River has exacerbated the issue. That is, construction of levees as a measure of flood control has interfered greatly with the natural process of rebuilding wetland mass. If a river basin is to remain active in the face of subsidence or a gradual sinking, it is critical that it compensate by a natural and continuous restoration. Assistant Chairman of the Coastal Restoration Technical Committee Chuck Killebrew on loan to the Governor's Office from the Louisiana Department of Wildlife and Fisheries explained the problem: “As the sediment from the river compacts it gradually sinks. Prior to levee construction there was an overflow of sediment rich water that offset this loss by restoring wetland areas. The restoration rate was higher than the subsidence rate. Now, the coastal marshes are experiencing a sediment accretion deficit, simply meaning that there is little or no replacement of sediment from river overflow.” With levees in place subsidence continues and precious land building material is swept out into the Gulf's deep waters by the river's surge.

Additionally, wetlands have been drained and converted for agriculture, and urban and industrial expansion.

One of the key players in the Governor's Coastal Restoration Committee is Dave Soileau. He comes from the U.S. Fish and Wildlife Service as an experienced water resources planner. As such he carries a unique set of qualifications: expertise along with an objectiveness toward the sensitivities of individual state agencies. He was appointed chairman of the technical committee and so functions as the coordinator of the state's response and spokesman for the governor's office. He provided the summary that follows of the site specific recommendations that were approved by Governor Roemer at the end of last year. Soileau explained that the report is a blueprint for short term and long term action and breaks

Channelization (top below) allows saltwater into freshwater areas, killing the vegetation. Without vegetation to hold the land mass in place (bottom), wetlands further erode. The nursery grounds for saltwater species, important wintering habitat for waterfowl and cover for furbearers is lost.

down into three types of recommendations: structural, policy and legislative, and other.

The restoration committee has addressed the problem head on. They have defined structural proposals, Soileau said, as major freshwater and sediment diversions at eight different locations on the Atchafalaya and Mississippi rivers. In areas where sources of freshwater of the type and extent needed to make major diversions are not available effective techniques in the management of the hydrology are recommended.

Using a broadstroke approach, Bob Misso explained further, "Unless we turn loose the Mississippi — major quanitities of freshwater — we are probably wasting our time. Without freshwater we will be unable to measurably restore areas of deteriorated wetlands. No one up until now has thought the unthinkable. In the past folks have always put the blinders on. The Corps never thought about that. The state never thought about that. No one thought about that. The only way to have vegetated wetlands on the coast is to have 100,000 cubic feet/second magnitude of controlled diversions when the spring floods come — that will run huge amounts of sediment in certain areas to offset subsidence and rebuild. It must be judiciously managed. Only when you need it, you allow the Big Muddy to flow. Unless we do the unthinkable, we may be wasting our time."

The committee has proposed policy and legislative recommendations, Soileau explained, on both state and federal fronts. They will lobby the legislature this spring to prohibit nonwater dependent activities in the wetlands. The rationale is that if the objectives of a commercial activity do not absolutely require it to be based in a marshland, it shouldn't be. In a companion bill the committee will argue that those activities, like oil and gas production, which are water-dependent will be authorized contingent on full mitigation of all direct and indirect adverse impacts to the environment.

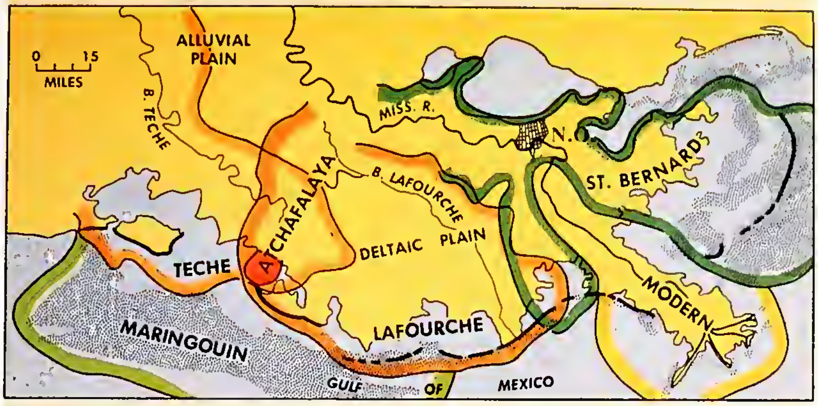
At the federal level the Louisiana Congressional Delegation stands well prepared to document the justification for expanding the mission of the U.S. Army Corps of Engineers. Fundamentally, the Corps' tour de force has been navigation and flood control. The delegation has outlined a plan to broaden that objective to include preservation and restoration of wetlands.

The third brand of recommendations, Soileau concluded, focuses on water resource

Miles and miles of what was once heavily wooded freshwater swamp are deteriorated as saltwater etches its way inland and brands the wetlands with the kiss of death.

projects already planned in the state of Louisiana. After close examination of such, projects which clearly indicate strong adverse impact on the environment would be opposed. Governor Roemer recently took a position against just such a project, the dredging of a major navigation channel through Vermilion Bay. In this precedent setting action the governor cited a less expensive and less environmentally damaging alternative.

MAJOR MISSISSIPPI RIVER DELTAS



FRAZIER 1967

BARRIER SHORELINE

DELTA COMPLEX	AGE (YEARS BP)
MARINGOUIN	7250-6200
TECHE	5700-3900
ST. BERNARD	4600-1800
LAFOURCHE	3500-400
MODERN	ACTIVE
ATCHAFALAYA	ACTIVE

The Missis[illegible] run through t[illegible] of this conti[illegible] ries, amassing [illegible] form the world's lar[illegible] active river delta. Landbuilding, over time lengthens the river's channel to the Gulf. Every 1,000 to 1,500 years the river changes course to take a shorter route to the sea. Each time the surging water mass redirects itself it also builds another delta. Six Mississippi River deltas have been identified and are illustrated in the chart at left. Denied their source of sediments by the change in the river's directon, the deltas slowly give way to the sea.

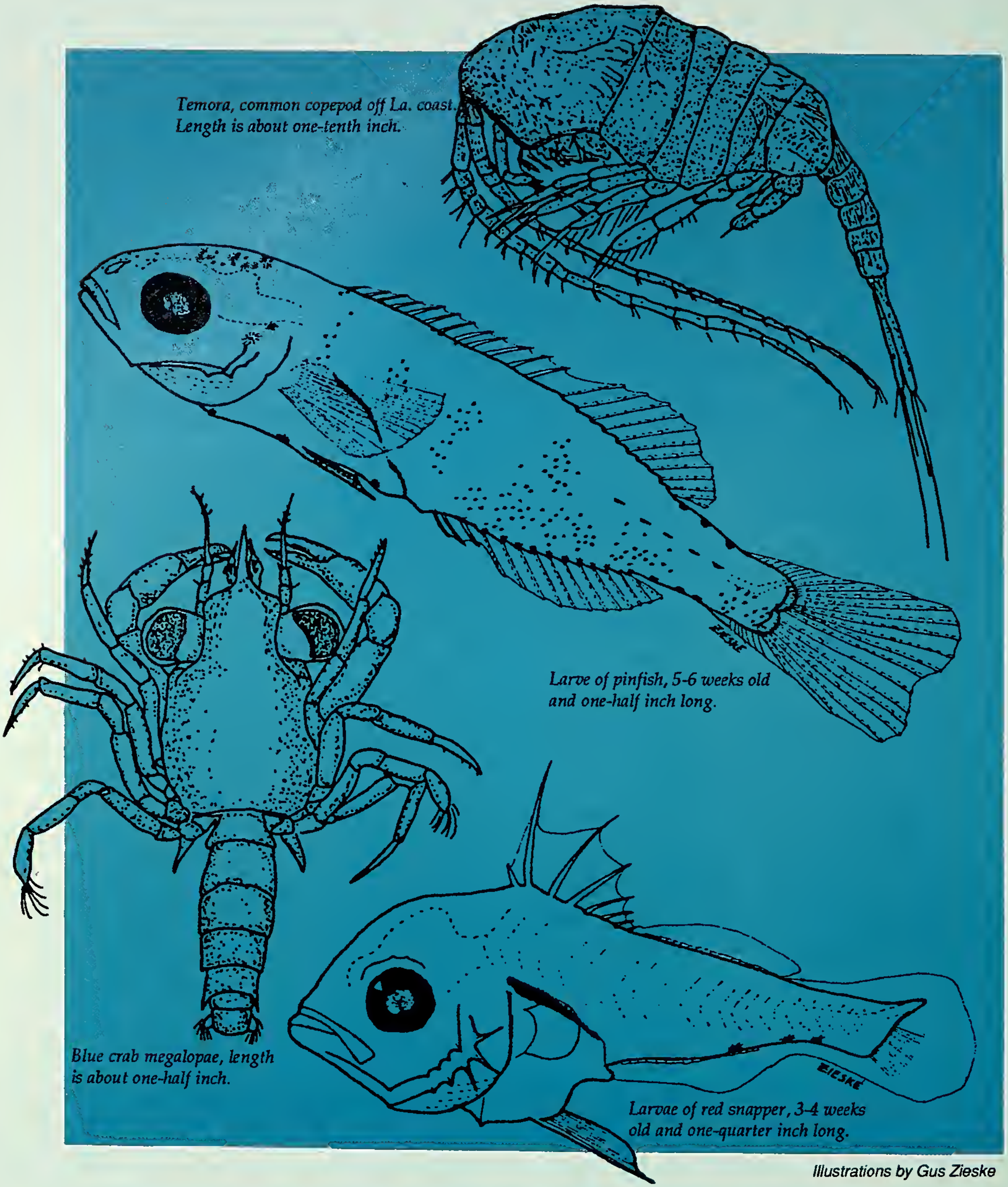
The time is ripe, it appears, for political action on this issue. At the national level, President George Bush has made a commitment to wetland preservation and to the allied policy of "no net loss." Building on this and working at the state level parallel to the Governor's Restoration Committee is Fresh Outlook for Coastal U.S. (FOCUS). A core of concerned Louisiana Senate and House members have developed an action plan to restore Louisiana's coast. Senator Ben Bagert Jr. and Representative Thomas Warner have made a convincing argument in support of key pieces of federal legislation before the Louisiana Congressional Delegation to Washington.

With the passing of the heyday of the oil industry, Louisiana is turning to a multi-based economy. The abundant renewable resources of our coastal vegetated wetlands provide a strong foundation on which to build. But if that foundation is not protected immediately and with strong long lasting measures, this option will literally disappear into the sea.

The Governor's Restoration Committee is poised for action and meaningful negotiation. The report reads: "It is a point of beginning. We suggest that these documents be used as a catalyst to provoke discussion, input and even controversy. It is a serious beginning to the development of dialogue and a unified effort to find solutions to a very difficult problem."

Governor's Coastal Restoration Policy Committee: Manny Fernandez, Office of the Governor, chairman; Virginia Van Sickle, Bob Misso, Department of Wildlife and Fisheries; Ray Stephens, Kai Midboe, Charles Groat, Department of Natural Resources; Paul Templet, Department of Environmental Quality; Curtis Patterson, Department of Transportation and Development; Brad Spicer, Department of Agriculture; Jack Van Lopik, LSU Center for Wetland Resources.

Coastal Restoration Technical Committee: Dave Soileau, Office of the Governor, chair; Chuck Killebrew, Office of the Governor, assistant chairman; David Chambers, Terry Howey, Jim Rives, Department of Natural Resources; Joel Lindsey, Department of Environmental Quality; Mark Chatry, Department of Wildlife and Fisheries; Brad Spicer, Mike Materne, Department of Agriculture; Ed Preau, Whitney Ledet, Department of Transportation and Development; Eugene Turner, John Day, LSU Center for Wetlands Resources. ☐



Temora, common copepod off La. coast. Length is about one-tenth inch.

Larve of pinfish, 5-6 weeks old and one-half inch long.

Blue crab megalopae, length is about one-half inch.

Larvae of red snapper, 3-4 weeks old and one-quarter inch long.

Illustrations by Gus Zieske

John Kern and Gus Zieske are biologists in the department's Coastal Investigations Section. They are responsible for collection and processing of all plankton samples collected by the department off the central Louisiana coast.

PLANKTON:

Tiny Creatures That Play a Big Role

BY JOHN C. KERN AND GUS ZIESKE

PHOTOGRAPHY BY GUY LABRANCHE

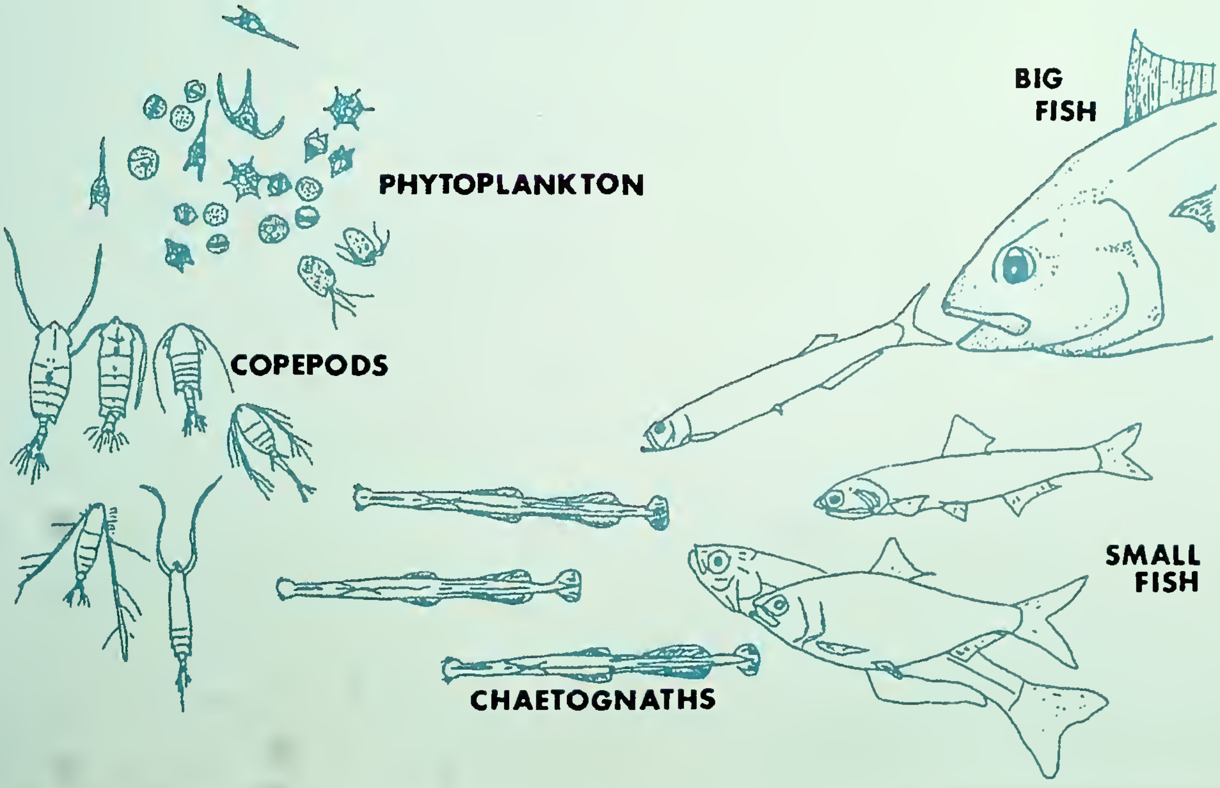
Louisianans who enjoy outdoor related activities know that Louisiana's bayous, bays, and coastal waters are teeming with life. Few, however, are aware of just how full of life our waters really are. In addition to the fish, shrimp, crabs, and oysters that we eat at mealtimes and the dolphins and seabirds that are fun to watch when we visit the seashore, there are thousands of species of marine animals that are often too small to be seen by the naked eye.

Plankton sample is collected in container on end of net at right. Drawings at bottom illustrate food chain that starts with the sun's energy being converted to plant material by phytoplankton. These aquatic plants are in turn fed upon by copepods which themselves are fodder for the even larger chaetognaths. Fish, birds and other animals then get in on the act.

When viewed through a microscope, many appear like occupants of wild nightmares or monsters created by Hollywood's special-effects technicians. These animals, which are unable to swim against water currents, are termed zooplankton by biologists. Microscopic aquatic plants are called phytoplankton.

It might surprise you to learn that several biologists with the Louisiana Department of Wildlife and Fisheries spend much of their time with their eyes glued to microscopes studying zooplankton. Why should department biologists spend their time studying animals that are often less than 1/10th of an inch long? Why are zooplankton important to Louisiana's seafood lovers? How can they be used to help look for pollution in our waters? To answer these questions, it is necessary to explain what zooplankton are and what role they play in the environment.

What animals make up zooplankton in Louisiana's waters? Zooplankton can be thought of as belonging to two main groups. One group consists of those animals that spend their entire life as plankton. These animals are usually small and may occur in very high numbers. The most abundant are usually *copepods*. Copepods are very small creatures that vaguely resemble shrimp and play an extremely important role in the marine environment. In samples taken last year, we found as many as 130 copepods in a volume of water equal to that in a can of soda. Much higher local concentrations undoubtedly occur in Louisiana waters. Slightly larger (up to around a couple of inches in length) members of the permanent plankton include *chaetognaths*, commonly known as



A neuston net is used to sample the water surface for larger planktonic organisms.

In bottom photo, "bongo" nets are being deployed for collection of Gulf plankton.

arrow worms for their distinctive body shape. A few members of the permanent plankton are very large, including jellyfish, such as the Portuguese man-of-war.

The other group of zooplankton consists of those animals that only spend part of their life in the plankton. Virtually all of the animals that live on the sea bottom such as worms, clams, and starfish have planktonic stages. Many animals start out as plankton, but end up as very recognizable adults, either caught on a hook or described on a restaurant menu. All of the important marine commercial and sport fish in Louisiana begin life as plankton, first as eggs and then as larvae. Immature stages of shrimp, crabs, and oysters are also part of the plankton before they reach the adult stage.

It is easy to understand the vital role of plankton in the ocean by making comparisons with what happens on the land. On land, the energy of sunlight is converted to energy-rich plant matter by grasses, shrubs, and trees. Grazers such as cows eat plants converting plant matter to animal matter. Therefore when people eat beef, they are getting energy that originally came from sunlight.

A similar process occurs in the ocean, differing most importantly in the length of the "food chain." A tiny fraction of the sun's energy that penetrates the water surface is converted to organic matter by phytoplankton. These microscopic plants are analogous to terrestrial plants. Grazers in the ocean are much smaller than those on land since the plants they eat are so much smaller.

The most important grazers in the ocean are copepods, which have jokingly, but appropriately, been called "cows of the sea." Copepods are fed on by larger zooplankton, such as chaetognaths and larval fish. There is no good land equivalent to chaetognaths. Chaetognaths may be eaten by small adult fish which, in turn, may be eaten by larger fish or birds. So the speckled trout you eat today is the indirect result of copepods eating phytoplankton in the past.

There are two main reasons why biologists in the Louisiana Department of Wildlife and Fisheries study plankton. One reason is that plankton are convenient to use in environmental monitoring programs. Plankton are easily sampled by towing a fine mesh net off the side of a boat; even very small boats can be used. A short tow of a few minutes can catch hundreds of thousands of planktonic animals.

Zooplankton such as copepods are thought to be very sensitive to pollution, and are therefore useful "tools" in an environmental monitoring program. In the event of a significant release of pollution, we would observe a change in both the number and kind of plankton species in our sampling area.

The second reason for studying plankton is to obtain information about immature stages of important species. We have learned a lot about the seasonality of spawning for important species, and also about the timing of migration of these species into and out of inshore waters. This information is important in developing management programs for commercial and recreational species. Catches of larval fish, postlarval shrimp, and crab megalopae in our plankton samples give us an indication of the spawning stock of adults. Therefore it provides an indication of whether adult populations of important species are healthy or in decline.

Plankton are useful tools for monitoring environment.

An example of the use of plankton data involves red snapper. Recently the department has been concerned that the adult stocks of red snapper may be decreasing. Records of larval red snapper catches being scrutinized as an aid in examining this question.

Other interesting questions may be addressed using data collected in our plankton program. For example, the effects of climatic changes may be reflected in the plankton. Plankton data from 1988 appears to be unusual for many species compared to data from previous years. Planktologists in the department will try to investigate whether this is a result of the severe drought that occurred last year and caused the low discharge of the Mississippi River into the Gulf of Mexico. We may be able to relate fish, crab, and shrimp catches in the near future to weather last year in the midwest.

The next time that you catch a fish or eat seafood at your favorite restaurant, reflect on the microscopic plants and animals that made it possible. Biologists in the Louisiana Department of Wildlife and Fisheries are striving to understand the dynamics of the plankton in our waters, both for use now and in the future in protecting and managing our precious natural resources. We know that size is no indication of importance. ☐

Upon collection, plankton samples are stored in jars and fixed with 10 percent formaldehyde.

Sea water is filtered through a special filter to collect chlorophyll.

At Sea With SEAMAP

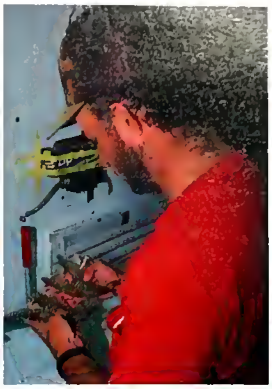
BY KAREN FOOTE AND JIM HANIFEN

PHOTOGRAPHY BY GUY LABRANCHE

The authors, biologists in the department's Marine Fisheries Division, have participated in SEAMAP for over six years. Karen Foote coordinates Louisiana's SEAMAP program and Jim Hanifen serves as chief scientist for the offshore cruises.

It's nearly midnight. Somewhere in the Gulf of Mexico the night watch has finished breakfast. Stars and production platform lights blink continuously. In the darkened wheelhouse, where big band tunes are softly playing on the radio, the captain announces "station".

The outgoing crew's last minutes are filled with a rush to finish work from the previous station: the last shrimp has just been measured. The diesel engines growl as the captain maneuvers the boat into position. Coffee is drained from the cups and the night's work begins.



The research vessel Pelican, 105-feet long, is based out of Cocodrie.

In the Gulf, from Florida through Texas, similar scenes are being played on other research boats. A snapshot of fish, shellfish (crustaceans) and conditions throughout the Gulf is being developed. This is SEAMAP.

The Southeast Area Monitoring and Assessment Program (SEAMAP) was created in 1982 to provide a series of instantaneous views of the Gulf over a long period of time. It has developed into an extensive and cost effective fisheries information gathering system.

All Gulf states and the federal government, through the National Marine Fisheries Service, receive federal funds and utilize "in kind" support to collect important offshore fisheries data which does not rely on directed fisheries efforts. This provides a real glimpse of conditions in the Gulf. Without it, tremendous biases are introduced, as fishermen only fish where and when there is a good chance for a catch.

Months before the research vessels leave the docks, the SEAMAP subcommittee, with Louisiana representation, of the Technical Coordinating Committee of the Gulf States Marine Fisheries Commission has approved the goals and sampling plan. Keystones of the program are the gulfwide use of standardized scientific sampling methods and the contribution of all participants' data into a centralized "at your finger tips" data management system. The cooperative nature of this Gulf-state/federal program has been lauded by fisheries managers and is being emulated in other parts of the nation.

The Louisiana Department of Wildlife and Fisheries provides Louisiana's contribution to the cooperative effort. Coming from as far as Slidell and Lake Charles, eleven marine biologists and technicians muster four times a year on the docks at Cocodrie. There they board the leased Louisiana Universities Marine Consortium 105-foot research vessel Pelican to spend a week at sea.

The ranks fill quickly during the calm months while only true sailors and conscripts come forward for the winter cruises. Each cruise sets out to cover 24 offshore sampling stations, stretching from the coastline out to 20 fathoms (120 feet) and from the Mississippi River to the waters off Atchafalaya Bay. This 4,000 square mile study area is in the heart of the country's most productive waters. Separate cruises in smaller boats cover the shallow portions of the state's offshore waters which are inaccessible to the large research vessel.

Marine life of all sizes from eggs to adults are collected and documented along with conditions of their environment. Sampling goes on around the clock, covered by three watches and coordinated by a chief scientist. Over 300 species of fish, shrimp and crabs have been taken from the bottom of the Gulf with the SEAMAP 42-foot bottom trawl.

The catches in each trawl can range from a handful or less to over a ton of squirming, jumping marine life and workup times vary accordingly. The scientific crew identifies, weighs and measures these animals. Standing at a trawl table, measuring shrimp to the millimeter while determining their sex and maturity is challenging in calm seas, but it tests the mettle of even the most dedicated marine biologist in rough weather.

In addition to the trawl, zooplankton nets sieve the sea to gather eggs and other microscopic stages of important marine life. Concentrated in a liter jar, the animals from a hundred cubic meters of seawater can number in the hundreds of thousands and appear as a highly animated soup. These samples are preserved for later identification and enumeration in a laboratory on shore. From the resulting charts and graphs, scientists can examine conditions of the fishery relative to spawning peaks, biomass, occurrence and abundance in particular months.

To a large extent, the catches in the trawl and plankton nets are dependent on environmental conditions. For example, if the dissolved oxygen concentration in the water is low, as typically happens in some areas during summer months, little or no life will be found. Also, very salty marine waters are home to different species and life stages than fresher waters nearer the coastline.

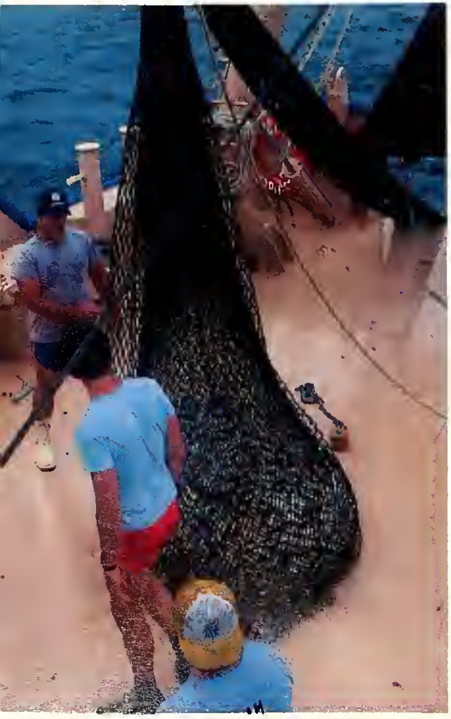
To document environmental conditions, precise oceanographic instruments are lowered through the water column at each station. Salinity, water temperature and dissolved oxygen concentrations are recorded directly into the computer and charts are immediately available for examination.

The pace is hectic, but the crew enjoys working at sea and knowing that they, along with their counterparts from across the Gulf, are providing keys to answering pressing fisheries management questions.

After the week's work is done, the course set for Cat Island Pass and home, the trawl table washed down and computers turned off, the crew gravitates toward the bow to watch the dolphins sport in the wake and talk is begun about "next time". □

Water samples and physical data are collected by lowering instrumentation down through the water column, right. In bottom left photo, trawl sample is unloaded on deck of Pelican and later sorted (bottom center) by species. Onboard computers (bottom right) are used to record data gathered during cruise.

Photograph by Jim Hanifen



Many materials that are presently ending up in landfills around the state are recyclable and reusable. DEQ is currently involved in addressing methods to encourage the removal of materials such as the tires, yard wastes and construction waste seen here from the waste stream and find ways to reuse and recycle them. This not only saves the cost of the disposal but also preserves our natural resources.

RECYCLING:

An Idea Whose Time Is Now

PHOTOGRAPHY & ARTICLE BY BUTCH STEGALL

Only a very few years ago, the term "recycling" brought to one's mind the idea of a philosophy that was put forth by only a very small number of staunch environmentalists who were often felt to not be in the mainstream of the thoughts and needs of the American society. These same people were even so idealistic and out of touch as to suggest such other ideas as maybe Americans could actually live without the large gas-guzzling cars of the same era, maybe we should seek environmentally safe herbicides and pesticides for our farms, maybe we should find ways to clean the environment of the pollutants of the past years from our industrial society.

Sound familiar? Look around today and see what has happened to the cars we drive, the chemicals we can buy and the vast amounts of dollars being expended to clean the environment. According to Dr. Paul Templet, secretary of the Department of Environmental Quality (DEQ), "You can pay on the front end in the form of effective environmental regulation, or you can pay on the back end in the form of clean-up cost. The least expensive option is most often the first option." Recycling fits this scenario perfectly! By implementing effective recycling programs throughout Louisiana now, future solid waste problems are being addressed on the front end.

Why do we see more and more organized

Butch Stegall is an environmental quality coordinator for the Department of Environmental Quality and is actively involved in the Louisiana recycling movement.

recycling programs coming into existence throughout Louisiana and what can each person do to be a part of this effort? Here are some answers to those questions and some insight into the current efforts and the future plans of DEQ. All of these will affect the future of recycling in the state and all will touch every person in some way, either immediately or in the near future.

Solid waste disposal practices in Louisiana have changed very dramatically over the past few years. As recently as 1980, there were several hundred disposal sites, mostly in the form of open dumps, located throughout the state. Some parishes maintained 30 to 40 sites. Because of various reasons, one of the most important being the implementation of the Louisiana Solid Waste Regulations at about that time, the situation today has very little resemblence to the situation of the early 1980s.

Recycling technology is dynamic and expanding rapidly. As new processes are developed in the future, materials that are not currently being recycled will, without a doubt, be constituents of the recyclable markets very soon.

Currently there are only about 40 landfills operating in Louisiana and all are operating under much more stringent standards than were in existence prior to the current standards imposed on the sites.

Environmentally safe landfills are very expensive to design, construct and operate as well as extremely difficult to site because of local opposition in almost any area proposed as a new landfill site. This has served to make the operators of the present facilities as well as DEQ much more conscious of conserving the available space in each site and to seek ways to assure that each is utilized in a method that is not only environmentally sound, but also is the most efficient.

According to the federal Environmental Protection Agency's latest data, the average amount of waste produced per person in the United States is about 3.7 pounds per day, an astounding 1,300 pounds per year. Some state and local studies have shown amounts of as high as six to seven pounds per day being generated by each person. These numbers have consistently risen since at least as far back as the World War II era. Our society has become progressively more oriented to disposable items under the guise of convenience, more often than not without any thought or consideration for the environmental consequences or the basic values of conservation of our natural resources. As the amount of waste produced has increased, many people have realized it only by the need to purchase more garbage bags or perhaps the addition of another garbage can to the household stock.

Louisiana, along with the rest of the country, has reached the time to seriously and effectively address the growing problems of solid waste disposal. Many communities in the state have been made acutely aware of what we are facing because of landfills becoming full, landfills being closed because of environmental risks, or proposed new sites not being available when expected. There are things we can all do to help reduce the amount of waste being landfilled, thereby contributing to the solutions for the situation facing every person in the state.

The average person in the U.S. produces 1,300 pounds of waste each year.

In an effort to effectively address the problem of solid waste reduction on a statewide basis DEQ is requiring a 25% reduction in the waste being landfilled within a 3-year period for all new or modified sites. Dr. Templet recently established advisory committees to work with DEQ in addressing the problems and issues of various aspects of the overall problem in order to help find ways to meet the goal.

Six areas of concern were identified to begin work on immediately. The areas are (1) Container/Packaging, (2) Batteries/Tires/White Goods (appliances), (3) Used Oil, (4) Paper/Newsprint, (5) Compostable Materials, and (6) State Procurement of Recycled Goods. These all present unique challenges and opportunities for progressive measures to be instituted toward solutions.

All the committees are addressing specific methods to reduce the amount of waste that ultimately ends up in the landfills and many of the solutions will have to be sought and found in some form of recycling. Recommendations and findings of the committees will be compiled into a comprehensive package to address the overall waste reduction issue. Those recommendations that require legislation will be presented to the 1989 regular session of the Louisiana Legislature for consideration.

The most common association that the majority of people have when they hear the word "recycling" is that of several containers being utilized at the household level to remove and segregate the various items in the waste. This is, in fact, the basis for most recycling programs and is effective in reducing the waste going to the landfill when done as an organized program that can enlist the participation of many citizens. Currently in Louisiana, the City of Lafayette is engaged in such a program that was initiated last October. Initial efforts focused on approximately 25,000 households and is expanding to a much greater number in the near future. Significant reductions in the amount of waste collected to be landfilled has already become very evident as the amount of materials collected and destined for recycling has increased each month that the program has been in effect. A parish-wide recycling program was initiated in Lafourche Parish in January and all indications are that it will rapidly become a very viable and effective part of the solution to the solid waste problem facing the parish. Other organized programs are currently in effect in Alexandria, Gonzales, Scott and Breaux Bridge to name only some. Many other municipalities and communities are at the present time actively pursuing the initiation of area-wide, organized recycling programs.

There are things that each of us can do in the recycling effort even if we are not a part of an area-wide program at the present time. Be aware of choice available in stores and choose those that are made of or are packaged in recyclable materials when possible. Don't be afraid to let the merchant or the manufacturer know that you desire to be able to purchase such goods.

Many easy ways to recycle at home are often overlooked because we traditionally think of removing the paper, glass and aluminum as being the only ways to recycle. What about the yard waste at your home? Why not start a compost pile that will not only reduce the amount of waste you've got to dispose of but will also produce a beneficial product that can be reused in your yard. Help organize or be an active participant in recycling through your church, garden club, school, or any other groups or activities with which you are affiliated.

There are many ways that each of us can be a part of the solution to the solid waste dilemma facing our state. The solution will not be simple, nor will it be achieved without each of us caring enough to be a part of the answer and not a part of the problem. As the solutions are proposed and programs instituted to address the issues, one thing is certain: you'll hear more and more about recycling, an idea whose time is here for Louisiana! ☐

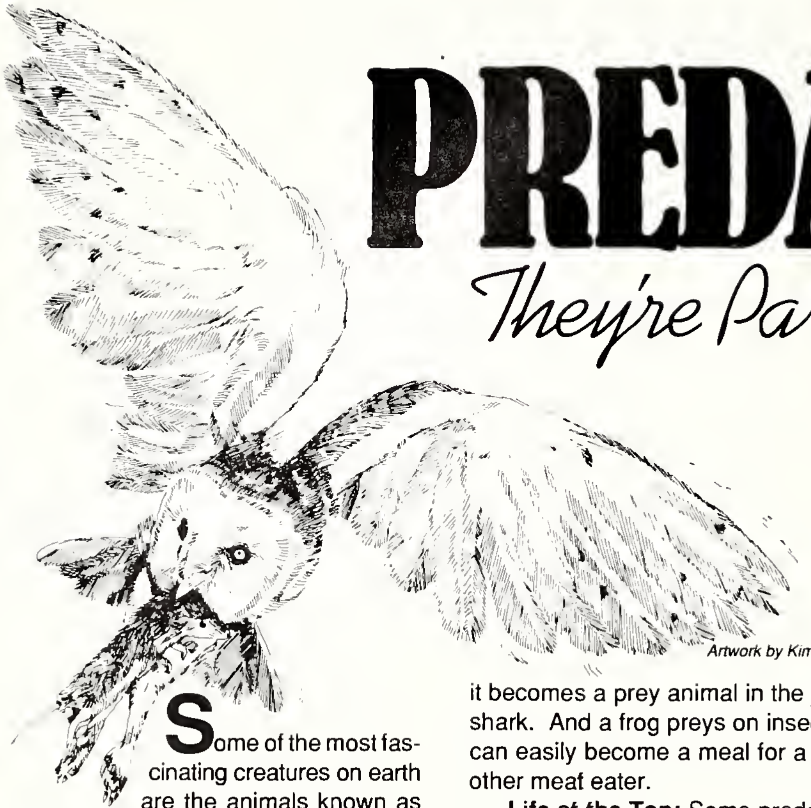
For more information on recycling, contact:

- Louisiana Department of Environmental Quality
- Louisiana Litter Control and Recycling Commission
- Agricultural Extension Service
- Parish or local libraries

Various curbside recycling methods are used around the state. The container system (above) is currently being used in Lafayette. In this, the recyclables are separated at the household level and picked up by a truck that has separate bins to receive the materials. The containers here are for separation of glass, cans and newspapers. Many programs, including the Lafayette program, are currently expanding to include plastics. Another type of curbside program in use in the state is shown at left. Lafourche Parish is utilizing a single bin system in which all recyclable items are placed in a common container and separated at a central facility.

PREDATORS!

They're Part of the Picture



Artwork by Kimberley Kerin

Some of the most fascinating creatures on earth are the animals known as predators. This year, Wildlife Week focuses on all kinds of predators, from the tiny, delicate-looking ladybird beetles that "patrol" lawns and gardens to the graceful and powerful jaguars that hunt in tropical forests.

Picture a sprinting cheetah closing in on a gazelle, a coiled rattler about to strike, a ghostly white barn owl flying silently through moonlit woods. All of these animals are predators: They catch, kill, and eat other animals, known as their prey. But many animals you might not normally think of as predators also catch and eat other animals. Picture a robin on your lawn, searching for worms. Or a group of ants attacking a beetle, then carrying the dead insect back to their colony in bits and pieces. All of these animals, from speedy cheetahs to tiny ants, are adapted to feeding on other animals.

A Matter of Degree: There are different degrees of predation, though. For example, strict predators, such as cats, crocodiles, hawks, and weasels, eat only meat. But some animals, such as raccoons, bears, and foxes, are part-time predators. These animals do catch and eat prey when they can, but they also eat a lot of berries, leaves, nuts and other plant parts.

Shifting Roles: Some predators play a double role. The baracuda, for example, is a predator that feeds on other fish. But it becomes a prey animal in the jaws of a shark. And a frog preys on insects, but it can easily become a meal for a snake or other meat eater.

Life at the Top: Some predators, the ones that often come to mind first, are known as top predators. These predators, which include animals such as wolves, the big cats, and birds of prey, have a certain combination of characteristics that other predators usually don't have. Most of them, for example, are strict meat eaters. They're relatively large animals too. And they usually aren't preyed upon by other animals.

Many top predators also need a lot of space in which to find food and mates and in which to raise their young. Because they need so much room, many top predators are having trouble surviving as their habitats give way to farms, ranches, highways, housing areas, and other development.

Predator Connections: To understand how a predator fits into its habitat, you can think of the predator as a link in a chain. More specifically, predators are links in a natural community's food chains; the routes along which energy flows through the community.

No matter what type of natural community you're talking about (a pine forest, a desert, or a coral reef, for example), the flow of energy almost always starts with the sun. So the sun in an important link in food chains. Through photosynthesis, plants, another link, convert the sun's energy into a form the plants can use.

The flow of energy continues as animals such as rabbits and deer eat the plants in their communities. Predators eat the plant-eating animals (and also some of the plants), and some of these predators are eaten by top predators.

Back to Basics: But the flow of energy doesn't end with predators. They and all of the other organisms in a community eventually die, and their bodies are broken down into simpler compounds by decomposers such as bacteria and fungi. The decomposed matter adds nutrients to the soil, encouraging plant growth. And a "new" food chain gets started.

Missing Links: What happens to a food chain when predators are removed from it? Researchers are still searching for answers. A lot seems to depend on the type of community and the predators involved. But in some areas, the loss of predators has resulted in a population explosion of prey animals. Too many prey can damage a habitat and throw the whole food chain out of whack, and animals may end up starving or dying of disease.

JAWS, CLAWS, AND PAWS

Take a close-up look at the eyes of an owl, the web of a spider, the jaws of a jaguar. You'll see the beauty and power of a predator, and you'll see some of the adaptations that make predators so well suited to a life of finding, catching, and eating prey.

Locating Prey the "Sensible" Way: If the wind is right, wolves can smell a moose or other potential meal from a mile or more away. This powerful sense of smell is one example of the well-developed senses many predators are equipped with. Sight and hearing can also be important to predataors, and in some cases, so can the sense of touch.

Chase It, Trick It, Trap It, or Gang Up On It: Locating prey is only part of the process of getting a meal. Actually catching an animal is another story.

One way to catch a meal is to be speedy. Many prey animals, such as ante-

American Kestrel

(Falco sparverius)

Where does it live? In open or semi-open land throughout much of North, Central, and South America and on islands in the Carribean Sea.
How big is it? Bill-to-tail length—9 to 12 in.; Wingspan—20 to 24 1/2 in.
What does it eat? Mainly large insects, but also rodents, snakes, and birds.
Predator bits: Kestrels often hunt along roadsides. Look for them in rural areas where they perch on telephone poles or hover over fields. The American kestrel is the smallest North American falcon.

Photo by: Breck P. Kent

Smallmouth Bass

(Micropterus dolomieui)

Where does it live? In lakes and quiet parts of streams with clear water and rocky bottoms. Smallmouths live throughout North America and have been introduced to Europe.
How big is it? Length—about 10 to 18 in.; Weight—from less than 1 lb. to about 5 lbs.
What does it eat? Small aquatic animals such as fish, frogs, and crawfish.
Predator bits: After a female smallmouth bass lays her eggs, the male that fertilized the eggs drives the female away. Then he carefully guards the eggs, chasing all other fish away and keeping the eggs free of silt by gently fanning the water with his fins.

Photo by: William N. Roston, D.O.

Sonora Mountain Kingsnake

(Lampropeltis pyromelana)

Where does it live? Several species of kingsnake live throughout most of North America. Our poster kingsnake lives in brushland and coniferous forests in moutainous areas of Utah, New Mexico, and Mexico.
How big is it? Length—up to 42 in.
What does it eat? Lizards, snakes, rodents, and birds. It kills by constricting, which causes the prey to suffocate. Our poster snake is eating a lizard.
Predator bits: Kingsnakes are called "king" because they often feed on poisonous snakes such as copperheads and rattlers. They're immune to the venom of these snakes.

Photo by: Joe McDonald/Animals Animals

Black and Yellow Argiope

(Argiope aurantia)

Where does it live? About 100 species of the spiders called argiopes live throughout the world. Our poster spider lives in grassy areas and along stream and lake margins in the eastern U.S., on the western coast of North America, and in Central America.
How big is it? Legspan of female—about 3 1/2 in.; Legspan of male—about 1 1/2 in. (Legspans of individuals vary.)
What does it eat? Insects and other invertebrates.
Predator bits: Argiopes often spin a zigzag pattern in the middle of their webs. This design may camouflage the spiders, strengthen their webs, or keep birds and mammals from running into the webs.

Photo by: Maria Zorn/Animals Animals

Broad-bodied Dragonfly

(Libellula depressa)

Where does it live? More than 4,000 species of dragonflies live throughout the world. Our poster dragonfly lives near ponds and swamps in Europe.
How big is it? Length—1 1/2 to 1 3/4 in.; Wingspan— 2 1/2 to 3 in.
What does it eat? Adult dragonflies eat mosquitoes and other insects. They capture their prey in flight in a "basket" formed by their front legs.
Predator bits: Immature dragonflies live in water and catch aquatic creatures with a special mouth part that shoots out and grabs the prey.

Photo by: Kim Taylor/Bruce Coleman, Ltd.

Jaguar

(Panthera onca)

Where does it live? Near water in the forests of South and Central America. At one time jaguars also lived in the southwestern U.S.
How big is it? Head-body length—45 to 60 in.; Tail length—17 to 26 in.; Weight—80 to 225 lbs.
What does it eat? Peccaries (piglike mammals), monkeys, deer, fish, and other animals.
Predator bits: Jaguars use their powerful jaws to crush the skulls of their prey. Unlike some cats, they swim and hunt in the water. Jaguars are endangered throughout their range because of habitat loss and illegal shooting and trapping.

Photo by: Darrell R. Jones

Great Crested Flycatcher

(Myiarchus crinitus)

Where does it live? In woodlands in the U.S. and southern parts of Canada, from the Atlantic Ocean to the Rockies.
How big is it? Bill-to-tail length—7 to 9 in.; Wingspan—13 to 14 in.
What does it eat? Mainly insects, but also some fruit.
Predator bits: Great crested flycatchers have "whiskers" surrounding the base of their bill. The whiskers form a small net and help keep the bird's prey from escaping. Great crested flycatchers often use bits of cast-off snakeskin or cellophane as nesting materials. They usually build their nests in tree cavities.

Photo by: Leonard Zorn

White-spotted Octopus

(Octopus macropus)

Where does it live? More than 100 species of octopuses live in oceans throughout the world. Our poster octopus lives in warm, shallow seas, usually near coral reefs or rocky formations.
How big is it? Arm-tip to arm-tip—12 to 24 in.
What does it eat? Crabs, lobsters, clams, and mussels. An octopus catches and grasps its prey with its sucker-covered arms.
Predator bits: Octopuses can turn many different colors. Sometimes, for example, an octopus's color will match the animal's background. And when an octopus gets excited, it often turns red.

Photo by: Peter Scoones/Seaphot Ltd.: Planet Earth Pictures

Grizzly Bear

(Ursus arctos horribilis)

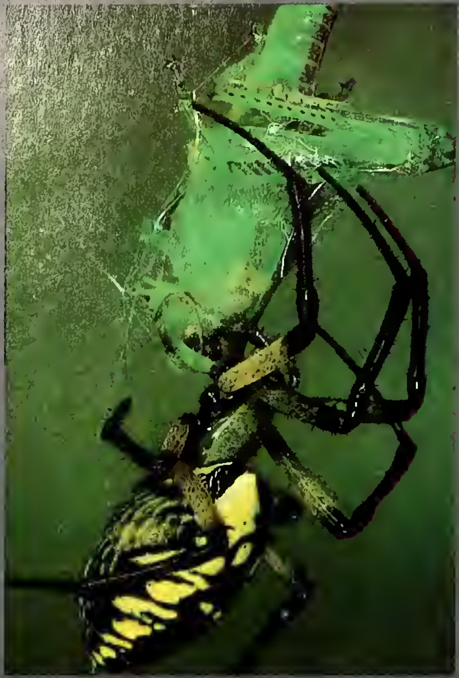
Ladybird Beetle

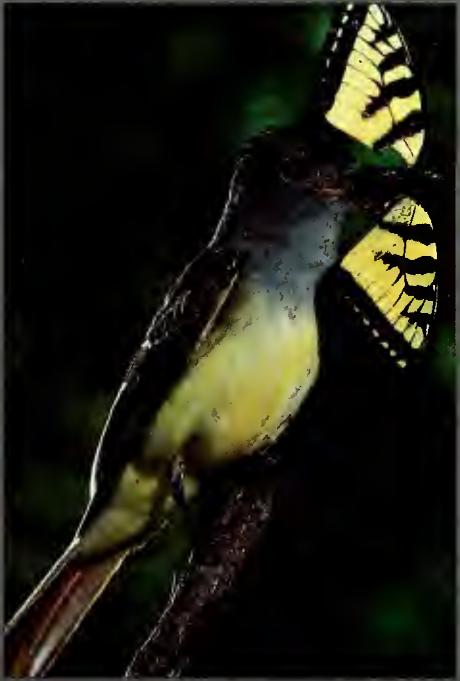
(Chilomenes lunata)

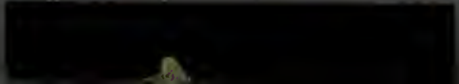
Brown Pelican

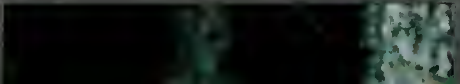
Graceful Chameleon

(Chamaeleo gracilis)









NATIONAL WILDLIFE WEEK MARCH 19–25, 1989
JOIN AND SUPPORT THE
NATIONAL WILDLIFE FEDERATION
AND STATE AFFILIATES

PREDATORS!

They're Part of the Picture

(Alaska, Idaho, Montana, and Wyoming) and western Canada.
How big is it? Length—6 to 9 ft.; Weight—usually between 250 and 650 lbs., although some adult males can weigh more than 1,000 lbs.
What does it eat? Mostly grass, leaves, and berries, but also some birds, fish, insects, mammals, and carrion (dead animals).
Predator bits: Grizzlies use their 4-inch claws to dig up roots and insects, break into beehives for the honeycomb, and snatch fish from the water. Despite their size, grizzlies can run at speeds of up to 30 MPH.
Photo by: Alan D. Carey

the world. Our poster ladybird beetle lives in African fields and forest edges south of the Sahara Desert.
How big is it? Length—less than 1/4 in.; Width—less than 1/8 in.
What does it eat? Our poster ladybird beetle eats only aphids.
Other species of ladybird beetles also eat aphids, as well as other insects. And a few species eat fungi or plants.
Predator bits: Ladybird beetles, often called ladybugs, are a symbol of good luck in many cultures. Some people believe that letting a ladybug crawl across your palm ensures marriage within a year.
Photo by: Anthony Bannister

parts of North, Central, and South America and the West Indies.
How big is it? Bill-to-tail length—4 to 6 ft; Wingspan—6 1/2 to 7 1/2 ft.; Weight—8 to 10 lbs.
What does it eat? Many types of fish and some crustaceans.
Predator bits: Pelicans often dive into the sea from a height of up to 30 feet. They are endangered in parts of their range as a result of extensive use of the pesticide DDT during the 1950s, 1960s, and early 1970s. But because DDT was banned in the U.S. in 1972, pelican populations have been increasing in some areas.
Photo by: Lynn Stone

which live in tropical areas. Our poster chameleon lives in scrubby areas and forests of tropical Africa.
How big is it? Head-to-tail length—18 to 20 in.
What does it eat? Mainly insects. With its sticky, lightning-fast tongue, a chameleon can snatch up an insect in about 1/25 of a second. This tongue is almost twice as long as its body.
Predator bits: Chameleons can change color, which helps them blend in with their surroundings. They are one of the few lizards that have a flexible, muscular tail. When a chameleon hunts, it often braces itself by coiling its tail on a branch.
Photo by: Bruce Davidson/Animals Animals

Tarsier

(Tarsius spp.)

Where does it live? In rain-forest trees in the Phillippines and in Borneo, Sumatra, and other islands of the East Indies.
How big is it? Head-body length—3 to 6 in.; Tail length—5 to 11 in.; Weight—3 to 6 oz.
What does it eat? Insects, lizards, and small birds. Tarsiers hunt by waiting in trees for prey to come near. Then they jump onto their victims and pin them down before eating them.
Predator bits: Tarsiers, which are named for their long foot bone, or tarsus, are well adapted to hunting at night. They have large eyes and moveable ears, and they can turn their head nearly 360 degrees. There are only three species of tarsiers.
Photo by: O.S.F.-Mantis Wildlife Films/Animals Animals

Gray Wolf

(Canis lupus)

Where does it live? On the tundra and in forests in parts of the U.S. (Alaska, Minnesota, and Montana), Canada, Europe, and Asia. At one time, gray wolves lived throughout most of the U.S.
How big is it? Head-body length—40 to 80 in.; Tail length—14 to 20 in.; Weight—57 to 130 lbs.
What does it eat? Mainly moose, caribou, and deer.
Predator bits: Gray wolves are endangered in parts of their range because of habitat loss and past efforts to get rid of them through poisoning, trapping, and shooting.
Photo by: Lynn Stone

Orca (Killer Whale)

(Orcinus orca)

Where does it live? In oceans throughout the world, particularly in cool, coastal waters.
How big is it? Length—20 to 33 ft.; Weight—6 to 10 tons.
What does it eat? Mostly seals, sea lions, fish, squid, and occasionally whales. Orcas often hunt cooperatively in groups for whales that are much larger than themselves.
Predator bits: Orcas often catch seals, penguins, or other animals that rest on ice floes. The orcas throw their bodies onto the edge of a floe, causing the prey to slide into the water, where the whales catch it.
Photo by: Fred Felleman/CEE

Bullfrog

(Rana catesbeiana)

Where does it live? In and around ponds or streams. Bullfrogs once lived only in eastern North America, but they've been introduced into other parts of the U.S. and into parts of the West Indies and Japan.
How big is it? Length—3 to 8 in.
What does it eat? Mainly insects, but also birds, mice, crawfish, salamanders, snails, and even other frogs.
Predator bits: Bullfrogs are the biggest frogs in North America. A bullfrog remains a tadpole for two to three years before changing into an adult.
Photo by: Dwight R. Kuhn

Written by Jody Marshall and Jennifer Pultz

NATIONAL WILDLIFE WEEK MARCH 19–25, 1989
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AND STATE AFFILIATES

PREDATORS! *They're Part of the Picture*

PREDATORS!

They're Part of the Picture

lope, rabbits, and deer, are quick on their feet, so many of the predators that feed on them are likewise adapted to moving fast. For example, cheetahs, the fastest land animals of all, can reach speeds of up to 70 MPH for short distances.

If you're a prey animal, being able to blend into your habitat is a good way to avoid being eaten. Plenty of prey animals rely on this strategy, from leaf-colored katydids to snowy-white Arctic hares.

But camouflage coloration is characteristic of some predators too. A jaguar's spots, for example, help the cat blend in with the sun-dappled rain forest foliage.

Some predators don't have to go hunting for their meals: instead, they let prey come to them. Many caddisfly larvae and spiders, for example, build silken traps that catch insects and other food.

In some cases, getting the prey to some to the predator is a "tricky" matter. Alligator snapping turtles, many angler fish, and certain other predators fool prey into coming closer. The snapping turtles have a pink, wormlike projection on their tongue, and the angler fish have a wormlike lure attached to the end of a fleshy "fishing rod" that extends from their head. When fish swim in to investigate these potenital meals, they often get eaten themselves.

Other predators put "team spirit" into practice. By hunting cooperatively in groups of several individuals, they can prey on animals much larger than themselves. And a single kill can often provide enough food for all. For example, groups of several orcas (killer whales) sometimes attack and kill larger whales.

Many predators have special weapons that help them catch, kill and eat their prey. Wolves and big cats use their strong jaws and long, stabbing canines. Orcas and sharks do the job with a whole mouthful of sharp teeth. Birds of prey have no teeth, but they do have powerful sharp talons on their feet.

Others, like some snakes (the constrictors), use their bodies as weapons. The snake coils its body around its victim and squeezes, or constricts, the prey until the animal suffocates.

Many snakes that don't constrict their prey use another method that is equally effective, poison. Many spiders also have a poisonous bite, and so do most shrews. And wasps can paralyze or kill a prey animal with their poisonous stings.

A few predators use tools in the pursuit of prey. Chimpanzees, for example, use sticks to probe for ants and termites. Egyptian vultures drop or throw stones at large eggs to crack them open. And sea otters open the shell of sea urchins and other prey by banging the shells against a stone.

PEOPLE AND PREDATORS

People/predator interactions are nothing new: they've been happening since the dawn of the human species. And over the course of time, our interactions have forced us into a love-hate relationship with these animals. On one hand, many people respect and value these hunters that are so powerful, so graceful, and so beautiful. Many cultures have even worshipped them as gods. But on the other hand, some people fear and mistrust predators and even view them with contempt.

When people started domesticating animals and growing crops, a new type of competition emerged. As more land was used for crops and grazing, less land and fewer natural prey were available to wild predators. As a result, predators began to attack cattle, sheep, chickens and goats to get the food they needed to survive.

Over time, predators were labeled "bad guys" and "murderers." Even fairy tales became saturated with "cunning" foxes, "bloodthirsty" wolves, and other negative images.

Problems for Predators: Many people dealt with their fear and mistrust of predators by trying to get rid of them. And government officials, from Greek rulers to English kings, put bounties into effect, giving citizens financial incentives to exterminate predators.

This tradition continued in North American where, in the 1630s, the first bounties were paid for wolves. And as settlers moved west, they not only killed wolves, but also cats, bears, and many birds of prey. They also cleared and fenced in thousands of acres for ranches and farms, forcing predators to live on smaller and smaller parcels of wild land.

The results were far reaching: Cougars, which had already been eliminated in the East, became less common in the West; red wolves disappeared from the South and Southwest; grizzles, which once roamed the eitire West, remained only in Montana, Wyoming, and Idaho; and gray wolves disappeared from all states except Alaska, Minnesota and Michigan.

Back Into the Picture: In the past two decades, public attitudes about predators have changed dramatically. Although predators are still controlled or killed in some states, most areas carefully regulate the taking of large predators such as wolves, cougars, bobcats and bears. A number of federal laws, most inclusively the Endangered Species Act, have helped protect many predators and other animals. But even with federal protection, many predators, including grizzlies, wolves and cats, are having a tough time surviving in our increasingly urbanized world.

As problems for predators increase, more and more people are beginning to see predators as they really are: not cruel, vicious murderers, but animals that play an important role in natural communities and that are equipped with amazing adaptations for catching prey. Many people also feel that predators add a special beauty and spirit to wild places.

These changing attitudes have resulted in some exciting projects designed to put predators back into areas where they once lived. For example, captive-bred red wolves have been released in the Alligator River National Wildlife Refuge in North Carolina, and peregrine falcons have been released into many parts of the country, including Denver, Baltimore, and other cities. Biologists are also planning to reintroduce gray wolves into Yellowstone National Park, a place where they once thrived.

All of these efforts reflect an increasing understanding of predators and a growing commitment to make sure wild predators always remain a part of the picture □

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A Well Kept Secret

BY MIKE COOK

Mike Cook is outdoor editor for the State-Times and Morning Advocate newspapers in Baton Rouge. He is immediate past president and chairman of the board of the Southeastern Outdoor Press Association.

Louisiana's wild turkey hunting is the nation's best-kept secret. That's what friends who came down from Kansas City to hunt each year keep telling host Ken Morgan of Jackson.

Many hunters swell up with pride and almost bust the buttons off their shirt when they call in and kill ONE wild turkey. Morgan, now 42 years old, has taken literally dozens of gobblers since he began hunting at the age of nine.

But Morgan — timber consultant for private landowners, basketball coach (along with his wife Linda) at Pine Hills Academy, author of a turkey hunting book called "A One-Man Game," manufacturer of the Morgan turkey call (a tube-type caller similar to, but larger and more versatile than, the snuff box), and turkey deer-hunting guide — has become much more conservative and conservation minded in recent years.

He believes Louisiana's turkey trapping and restocking program has been a big success. "But," he said, "if everyone who had a license to kill a turkey killed one, they'd soon be gone.

"If wildlife is going to continue to be a renewable resource, we'd better use it properly."

Danny Timmer, turkey study leader for the Louisiana Department of Wildlife and Fisheries, is continuing a successful program of turkey trapping and restocking that now-retired Dan Dennett supervised before him.

The biologists use bait (illegal for hunting) to attract turkeys to an open area and when the birds are properly grouped and feeding they trigger four rockets to fire a 60 by 40-foot net over them. It's so fast the birds have little time to react and escape. The turkeys are banded and quickly transported to other areas to be released.

"Normally," Timmer said, "the area where the turkeys are released is closed to hunting for three to five years, and on about 90 percent of the areas restocked we have an agreement with the landowner to trap for 10 years."

Timmer estimates there are now 35,000 wild turkeys in Louisiana, pursued 16,000 licensed hunters who kill about 6,000 birds during the spring hunting season.

Thanks to the LDWF's restocking efforts, spring gobbler hunting is now permitted in parts of all parishes except West Carroll, Union, Morehouse and the coastal parishes south of I-10.

In 1987 Timmer and his crews trapped and moved 259 turkeys; last year they relocated 155. "That doesn't sound like many," Dennett said, "but it takes a hell of a lot of effort to move that many birds."

"We're concentrating on restocking in northwest Louisiana now and moving toward the northeast," Timmer reported. There have, however, been stockings in other parts of the state, including one within 20 or 30 miles of Baton Rouge.

Wild turkeys were once numerous in the state but their numbers were greatly diminished by loss of habitat and both legal and illegal hunting. Market hunting was once legal and, despite stiff penalties, poaching continues.

According to Timmer's old-time records, Louisiana had neither a closed season nor limits on turkeys from 1902 through 1904. From 1905 through 1910 the daily limit was 25, and beginning in 1911 there was a limit of one a day, but still no closed season. The season was closed from 1933 to 1944 and again from 1949 until 1954. Louisiana's first trapping and restocking effort began in 1962 when only one bird was caught and transplanted. Similar efforts have been made throughout the nation, and (although some deer and alligator biologists might disagree) the wild turkey program is considered by many to be the greatest success story in wildlife management.

"Game laws were hardly thought of back at the turn of the century," Dennett said. "A lot of people were living off the land, especially during the Depression, and there was loss of habitat when virgin timber was harvested. By 1946 wild turkeys had almost completely been eradicated.

"With the coming of wildlife management areas in the late 1940s early 1950s, the Wildlife and Fisheries Commission (as the department was known then) realized it needed to restock several species of wildlife. The big program was deer restocking, which was highly successful. Deer were down, but not quite as bad as turkeys because the habitat was more favorable for deer.

"They also attempted to stock turkeys, but instead of using wild trapped birds they bought game farm birds — somewhere in the neighborhood of 5,000 — from sources in the East. These turkeys were liberated on wildlife management areas in the attempt to restore the turkey population in a hurry, but it was unsuccessful in every instance.

"Not only did Louisiana discover the hard way, but so did practically all the Southeastern states. They found they needed live-trapped wild birds. Louisiana got some from Mississippi, some from Alabama and traded marsh deer to Florida for some. By 1963 we were back into business, restocking areas we thought had the most promise — the best habitat and protection, and support from the local people.

"We looked for areas with a good diversity of mature mast-producing hardwoods, probably several small stream bottoms throughout the area, not subject to excessive flooding, a minimum number of dwellings and all-weather access roads, and areas low in turkeys.

"We used radio telemetry so we could follow some of the released birds to see what habitat types they spent most of their time in, their radius of travel, their reproduction, etc.

"Not every release you make is a complete success. Factors like weather or a change in habitat can cause them to fail. We might give it two or three years and come back with a few more birds and the population would take right off."

Now that Louisiana's wild turkeys are on the road to recovery, where and how do you hunt them?

Choose Your Weapon

The choice of firearms and shot size appears to be largely a matter of personal preference and confidence. Rifles are not legal for turkey hunting in Louisiana, but bows and arrows are.

Huey Sanders, one of south Louisiana's most successful turkey hunters, suggests a 12 gauge full-choke shotgun and No. 4 shot. Dennett also likes a full-choke barrel and either high-density No. 2 or No. 4 shot in a shot collar to prevent deformation.

Ken Morgan uses a double-barrel .410 shotgun with three-inch shells and No. 7 1/2 shot. He likes the larger number of shot.

All three advise shooting at no more than 25 to 35 steps and aiming at the head and neck.

Photo by Steve Maslowski

"Even if you had a cannon, you'd want to shoot the head and neck," Morgan said, "because the central nervous system is the only place you can kill a turkey every time. I've found that seven and a halves at close range, with a three-inch shot column, really works for me."

When Not To Shoot

"Never shoot at a strutting turkey because he has his chest out and his head and neck drawn up," Sanders cautions. "Give him a yelp or cluck and make him straighten up and then drop the hammer on him."

Bow Hunting

If there's anything more challenging than shooting a wild turkey (considered by many to be the wariest of Louisiana's wildlife) with a shotgun it's shooting one with an arrow. Morgan says he has taken turkeys with a bow but became soured on it after he lost a gobbler he had wounded.

Where To Hunt

Dennett advises beginners to talk to veteran hunters to learn about areas with good turkey populations. Morgan says the best turkey hunting is invariably on private property but that several state-operated wildlife management areas and some private but unposted land in the western part of the state have good turkey hunting. Sanders advises getting the permission of the landowner before scouting or hunting. "Don't get off on the wrong foot by trespassing," he cautions.

Photo by Steve Maslowski

Timmer and Morgan agree the Ft. Polk Wildlife (Vernon Parish) and Peason Ridge (straddling the Vernon, Sabine, Natchitoches parish borders) Wildlife Management Areas are the top WMAs for turkey hunting. But Ft. Polk is owned by the U.S. Army and the U.S. Forest Service and Peason Ridge by the Army; daily military clearance is required at both before hunting. Timmer cautions, "It's a day-to-day thing."

Timmer said portions of the Kisatchie National Forest are also good for turkey hunting, as are the Boise-Vernon and Big Lake WMAs. A few birds might also be taken from the Ben's Creek and Sandy Hollow WMAs in south Louisiana.

The Pearl River WMA near Slidell is also open for turkey hunting but Timmer said there was a poor hatch this year because of high water. He reported biologists haven't seen a young turkey there this year.

Morgan, Butch Trahan and Van Morgan, all of Jackson and William Yarbrough, formerly of Lake Charles, have had good success hunting on private timberland near Sugartown (east of DeRidder) that is still open to the public.

"There's a large number of turkeys there and we went miles and miles without seeing any other hunters," Ken Morgan said. "Everywhere we went, we found turkeys. The key was finding the creek and river bottoms where the pine plantations and the hardwoods came together. The turkeys weren't in either the pines or hardwoods but on the edges.

"We all got gobblers, but when Yarbrough took a big one to a little store to weigh it, the people there acted like they didn't even know they had turkeys in the area."

Scouting

The veteran hunters advise going scouting well before the opening of the season, looking for signs (tracks, scratchings, droppings) to determine where the birds are roosting, loafing and feeding. Your hunting strategy depends on knowing where the birds are.

"If I know where a gobbler is, I might call a little before it sets daylight," Ken Morgan said. "If I don't know where he is, I try to wait until its light enough for him to fly down. It's embarrassing to call a turkey and have him sitting in the tree right over your head.

"Being familiar with land use changes is most important," Morgan continued. "That's the only reason I scout, because usually the turkeys are in the same area every year. Logging doesn't seem to bother them but land clearing, farming, development, seismograph activities and other things not normally going on will make them move.

"Mixed pine hardwoods generally are where most of the turkeys will be. In pure hardwood stands, most of the mast rots before the spring season opens. The mixed forests are better drained and the mast is covered.

"Probably the best place to find turkeys in the springtime is where there is a good source of running water. Spring branches is where they like to be because they have a wide variety of roosting, feeding and loafing habitat. Later in the spring they like openings—fields and log roads."

Dennett says turkeys prefer to roost over water but in piney woods they roost in mature pines.

Dress

Because of the wild turkey's keen eyesight, camouflage, including face paint or a camouflage net covering the face and hands, is helpful. Covering scent isn't as important as for deer hunting.

Keep yourself hidden, but not so well that you can't see the turkey if he comes to you.

Calling

There are hundreds of brands of turkey calls, but Huey Sanders breaks them down to two basics, friction calls (such as slates and boxes) that are rubbed, and air calls (turkey wingbone, diaphragm, etc.) which are sucked or blown.

The basic hen calls necessary for the hunter to know and use are the yelp, the cluck, the purr, and the cackle. A gobbler will also respond to an owl hoot. Ken Morgan says he uses eight or nine callers because each has a unique sound and gives a particular call best. The diaphragm call is one of the hardest to learn but is the most popular because it leaves both hands free for shooting.

Some hunters, including Morgan, also occasionally use a gobble, but they use it cautiously because it has a tendency to attract more hunters than turkeys.

"It's dangerous," Morgan acknowledges, "and in some places I've hunted I wouldn't even risk it. But it does bring very young turkeys. The solitary old gobbler usually doesn't respond to the gobble that well. He ain't interested. It reminds me of that elk I tried to bugle up a few years ago in Colorado. He came out and ran all the cows off and then he went with them. He wasn't interested in having company."

Some veterans advise calling sparingly. George Hatcher, who retired from turkey hunting at the age of 81 after killing "about 90" birds, says the secret of his success was not calling too much. Others say the hunter can't call too much. Most agree, though, that when a gobbler is responding and coming to you, don't take a chance of spooking him by overdoing it.

Morgan tries to get to within 150 yards of some gobblers before he starts working him, but he says its necessary to stay as far as 300 yards from the older, smarter, more wary birds.

Dangers

Because the hunter is well camouflaged, hiding and making noises like a turkey, turkey hunting is one of the most dangerous of the hunting sports.

"It's a situation made to order for someone who is trigger happy," Dennett said. "When you hear someone in your area it's a good idea to relocate or make contact with that individual and let him know you're in there, too."

Attitude

Don't get caught up in the complications of turkey hunting. It just might not be as difficult and challenging as it appears.

"The most important thing," advises Ken Morgan, "is to have the right attitude. You can't be too intense about killing a turkey. The harder you try, the less lucky you're likely to be. If you hunt with a more relaxed attitude you're likely to be much more successful. Being in the right place at the right time is a close second.

"The most successful hunters I know are those who are good woodsmen. They're not necessarily good callers, but have a lot of stealth qualities." ☐

Photo by Steve Maslowski

Thanks to the LDWF's restocking efforts, spring gobbler hunting is now permitted in parts of all parishes except West Carroll, Union, Moorehouse and the coastal parishes south of I-10.

All You Need to Know to Catch MARSH BASS

BY MICHAEL MEADOR AND WILLIAM KELSO

Michael Meador is a Graduate Assistant and William Kelso is an Assistant Professor in the School of Forestry, Wildlife, and Fisheries, Louisiana State University, Louisiana Agricultural Experiment Station, LSU Agricultural Center, Baton Rouge, LA 70803.

Thousands of sportfishermen take advantage of the excellent largemouth bass fishing available in Louisiana. Although many Louisiana anglers fish for largemouth bass in oxbow lakes, bayous, and man-made impoundments, few anglers realize that bass can also be found in the extensive marshlands located throughout coastal Louisiana.

Catching "marsh bass" on alternate casts with redfish, speckled trout, and flounder can provide a unique fishing experience. Relatively little is known about the ecology of largemouth bass in marsh habitats, yet angling for marsh bass has increased in popularity in Louisiana during recent years.

Since 1985, we have studied the growth, food habits, behavior, movements, and physiology of marsh bass in canals near Cutoff, Louisiana. Inhabiting a marsh environment presents several potential problems to a freshwater fish, not the least of which is increased salinity. Depending on prevailing winds, water in Louisiana's marshes can change quickly from fresh to nearly one third seawater [10-12 ppt (parts per thousand)] in the period of a few days. Such changes in salinity make it difficult for a freshwater fish to regulate its blood chemistry, and high salinities can be lethal if conditions persist.

Our laboratory experiments indicated that adult marsh bass selected higher salinities (3 ppt, about 1/10 seawater) more often than adult freshwater bass, but salinities above 6-8 ppt caused stress. In addition, when exposed to salinities above 8 ppt in the laboratory, bass ceased feeding almost immediately. Marsh bass anglers should take note that if salinities have increased rapidly over a short period of time and are above 6 ppt, angling success will most likely be low.

Field tracking experiments using marsh bass implanted with internal ultrasonic tags indicated that their behavior during times of mild salinity (less than 2 ppt) was much like the behavior of freshwater bass. Tagged fish moved back and forth along a 300 to 600-meter section of canal shoreline, ranging further offshore at night. When rooted vegetation was sparse, marsh bass were typically found close to shore near any type of structure that might provide cover.

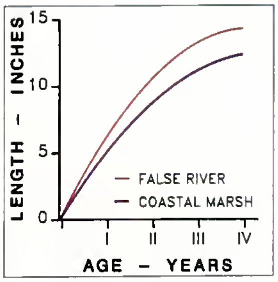
However, when salinities increased to 8 ppt, no tagged marsh bass could be located in the study canals, although bass under 8 inches in length were still present. A search of the surrounding canals and lakes within 5 miles of the study site also revealed no tagged bass. It appears that adult marsh bass are very mobile during periods of saltwater intrusion, an observation also reported by researchers in Alabama. Monitoring salinity levels can save a lot of fishing frustration, as areas that support high numbers of bass one day may be devoid of all but young fish a few days later.

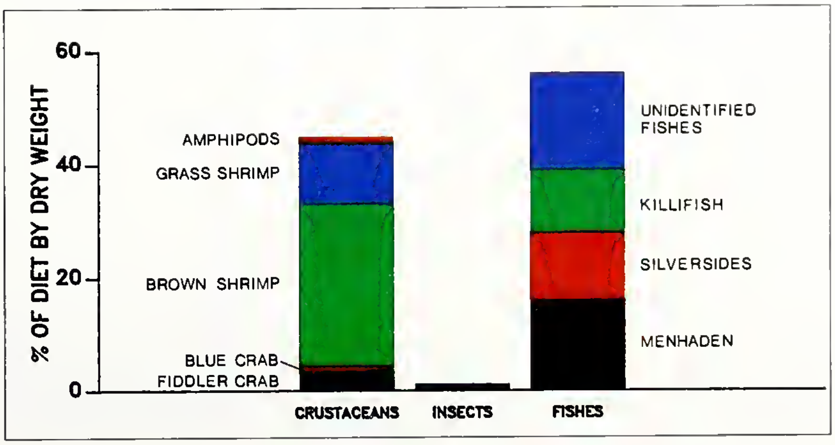
Marsh bass are an excellent sportfish on light tackle, but they are typically smaller in size than freshwater largemouth bass of equal age. Differences in length-at-age between marsh bass and freshwater bass appear to be consistent throughout their range from Texas to Delaware. In Louisiana, marsh bass average about 10 inches in length and one-half pound in weight; the largest marsh bass collected during the study was 14 inches long and weighed 2 pounds.

Despite being shorter than freshwater fish of the same age, marsh bass collected during our study were consistently stocky and exhibited a high condition factor, an index based on length and weight measurements that is used by fisheries biologists to assess a fishes' well-being. Condition factors of marsh bass were uniformly high throughout the year, which indicated that Louisiana's marshes provided excellent bass habitat during all seasons. Similar observations of high marsh bass condition have been made by other researchers along the Gulf coast.

However, a puzzling situation arises when you consider marsh bass condition and length at age compared to freshwater fish. The consistently high condition of marsh bass indicates that the marsh habitat provides adequate resources for the bass to maintain a robust body form. However, if the habitat is so

Growth of marsh bass and largemouth bass from False River is compared on graph below. Marsh bass are already smaller than their freshwater counterparts at age I, and the differences increase as they get older. Chart at bottom shows food habits of largemouth bass captured near Cutoff. Note the importance of crustaceans in the diet.





good for marsh bass, then why are marsh bass smaller than same-aged freshwater bass? The answer to this question probably lies in the complex interaction between largemouth bass biology and the physical, chemical, and biological characteristics of the marsh. However, our research indicates that two factors, in particular, may have an important influence on marsh bass growth.

First, largemouth bass are usually the dominant predator in freshwater lakes. In contrast, alligators, gar, and red drum are at the top of the marsh food chain, and an average-sized marsh bass is vulnerable to many marsh predators. Approximately 40% of the bass we collected in the marsh had scars and wounds indicating that the hunter had become the hunted, and many fish had more than one scar. Marsh bass appeared to reduce this predation risk by remaining near the shoreline during the day, typically in water less than 2 feet in depth.

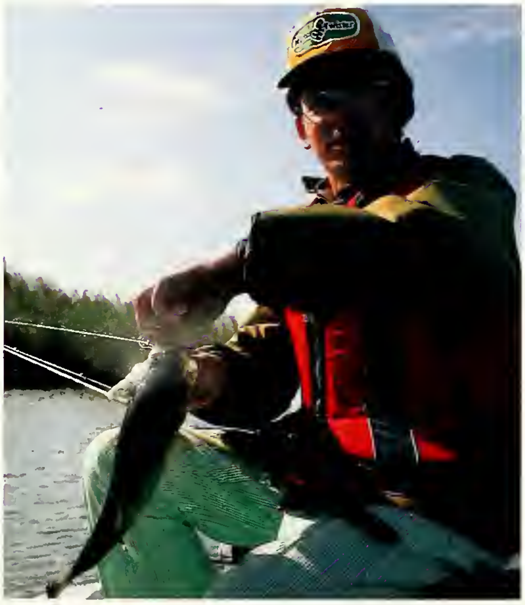
Electroshocking surveys indicated that when salinities were low, marsh bass were located in dense beds of rooted vegetation, where their vulnerability to larger predators (including fishermen!) would be low. However, the ability of largemouth bass to pursue and catch prey declines dramatically in dense vegetation.

In addition, the vegetation-dwelling prey community is dominated by small invertebrates such as grass shrimp and small crabs. Crustaceans made up nearly 50% of the diet of adult marsh bass examined during our study, and over 60% of the diet in three marsh bass populations studied by other researchers in Mississippi. In contrast, fish typically comprise over 90% of the diet of adult largemouth bass in freshwater habitats.

The differences in diet between freshwater and marsh bass were not due to a lack of forage fishes. Schools of menhaden and other small fishes were abundant in the open-water areas of the study canals, but pursuing these fishes would expose bass to larger predators. Increased hiding behavior by bluegill in response to the presence of largemouth bass has been reported by other researchers, and it is possible that marsh bass have assumed the role of the bluegill in the predator-prey structure of the marsh.

By remaining in the vegetation, marsh bass may be reducing their risk of being eaten. However, by avoiding larger predators and remaining in dense structure, marsh bass may

Approximately 40% of the bass collected in the marsh had scars and wounds indicating that the hunter had become the hunted, and many fish had more than one scar.



also be restricting their diet to prey that do not provide sufficient energy for maximum growth. A smaller body size may also be better adapted to the shallow, vegetated habitats along marsh shorelines. It is important to realize that although marsh bass are typically smaller than freshwater bass, marsh bass growth is not "poor" it is merely different, and is probably adaptive for life in the marsh.

Second, although Louisiana's marshlands are productive, the marsh can be a very harsh environment for fish. Marsh water temperatures during summer typically exceed 85 degrees F, and dissolved oxygen levels are frequently low. When the stresses of high water temperature and low dissolved oxygen are combined with increased salinity due to strong winds from the south, marsh bass may be required to expend considerable energy maintaining themselves, with little extra energy available to maintain growth rates comparable to freshwater bass populations.

Regardless of how they manage to survive, marsh bass provide an excellent opportunity for sportfish enthusiasts to try their skills. The abundance and feeding tendencies of marsh bass are highly dependent on salinity levels. Even if salinity levels are low, locating marsh bass along a featureless canal shoreline is challenging. However, when salinities permit, marsh bass can be quite abundant in certain areas near weedbeds, canal mouths, and cuts in levees that drain adjacent marshes. Their tastes in angling hardware tend towards spinner baits and plastic-bodied lures that can be worked in shallow water in dense cover.

Because marsh bass are typically small, size limit regulations have been suggested by coastal fishermen to reduce angling mortality and increase the numbers of large fish. However, it appears that marsh bass growth is more a reflection of the marsh environment than of harvest rates, and such regulations seem unwarranted. In view of marsh bass movement patterns and abundance fluctuations, the physical and chemical characteristics of the marsh environment, and the diverse predator community that these fish must contend with, it is doubtful that fishing mortality is a significant factor affecting marsh bass growth or population size.

Bass fishing is alive and well in Louisiana's marshes, and the fact that largemouths occur in these habitats in the face of such apparent adversity is a tribute to the adaptability of one of our most highly-prized sportfish. ☐

Regardless of how they manage to survive, marsh bass provide an excellent opportunity for sportfish enthusiasts to try their skills.

Photographs by Jeff Watson

Raccoons

BY MARTY EDMUNDS

The raccoon, *Procyon lotor*, is probably one of the most recognizable mammals in North America. Its silver fur, black mask and ringed tail distinguish it from most other animals. Because it is very intelligent and highly adaptable, it is found in almost all habitats in North America. Raccoon introductions have even been successful in Germany and the Soviet Union.

Raccoons are truly omnivorous, eating anything from carrion and garbage to frogs and crawfish to acorns, persimmons, blackberries and most other fruits. Where high populations exist, they can be detrimental to farmers by eating crops of corn, oats, watermelons, cherries and grapes. Raccoons have been reported to be significant predators on nests of rabbits, muskrats, Canada geese, wood ducks, sea turtles and alligators.

In Louisiana, mating season typically takes place from late December through February. However, some information suggests that mating in Louisiana may also occur in early summer, accounting for small raccoons seen in the fall. Gestation is 63 days, at which time young will be born with eyes closed and remaining closed for 21 days. The average number of young per litter in Louisiana is 2.8. Young raccoons will stay in the den nursing for 9-10 weeks and then become free ranging and begin to hunt with their mother.

Reported age and sex ratios vary greatly across the country. Data indicates immature raccoons may comprise from 30 to 70% of the population. Similar variations are reported in sex ratios.

Weights of raccoons in Louisiana average about 10.5 lbs. for adult males, 8.5 lbs. for adult females, and 5.0 lbs. for free ranging immature animals. Raccoons can weigh much more, as indicated in a South Dakota report of weights approaching 50 lbs.

The highest raccoon density reported was in 1949 in Missouri near a waterfowl refuge. One hundred raccoons were removed from dens on 101 acres. Most studies show densities usually average one raccoon per 10-20 acres.

Information on home range shows that maximum home ranges for raccoons average 0.5 to 2.0 miles with some as high as 4.0 miles. Most home ranges encompass from 100 to 250 acres.

The raccoon is one of the most economically important fur animals in Louisiana as well as the rest of the country. In Louisiana, in some seasons as high as 254,000 may be harvested, returning nearly 3.3 million dollars to the hunter and trapper. About 60% of the state's raccoon harvest is taken north of the coastal marsh. Although raccoons are taken for fur during the trapping season (mid Nov. - mid Feb.) when hides are prime, a large percentage are harvested by raccoon hunters. Raccoon hunting is a very old and popular sport in Louisiana. Usually two or three hunters will be involved in the nighttime hunting party along with a pack of several good treeing dogs such as walkers, black and tans, and blue ticks (among others).

Most often they will hunt areas such as swamps, creek bottoms, and beaver ponds, knowing that at night raccoon will be feeding around these shallow water areas. When dogs "strike" a fresh track, the "race" is on. Soon the raccoon will seek refuge in a tree. With dogs barking, the hunters approach the tree the dogs are on and try to shine the raccoon's eyes. Although raccoons may only be taken for fur during the trapping season, many dedicated hunters continue to hunt during the spring and summer, often with no intention of killing the raccoon but simply to listen to a good pack of hounds work.

If we are to provide good habitat for raccoons, wetlands must be maintained along with its border vegetation. Hollow trees and snags should be kept for den sites. Over burning or grazing on large areas will not allow thickets of blackberries and huckleberries to exist, denying good spring and summer feeding grounds.

In addition, some grassy open plots should be maintained for "bugging" areas and mass-producing and fruit bearing trees should be promoted and preserved. □

Marty Edmunds is a biologist with the department's Fur and Refuge Division.

Wildlife Calendar

1989-90 Photo Contest!

Would you like to see your own favorite photograph used to illustrate Louisiana Conservationist's 1989-90 wildlife calendar--and win a $100 cash prize?

Our July-August issue once again will consist of an attractive and informative full-color calendar that you'll want to hang on your home or office wall and perhaps preserve as a keepsake.

To illustrate it, we need to select 14 color transparencies depicting Louisiana wildlife and scenic backgrounds—one photo for the magazine's front cover, one for the back cover and one for each month.

And for every photo we use, we'll pay $100!

We are looking for closeup pictures of living animals in their native habitat: Game species such as ducks, turkeys, raccoons and fish; nongame animals such as insects, reptiles and songbirds. You can put people in the picture engaging in outdoor activities like boating, trapping and camping.

Don't forget that a calendar marks the seasons—fall and winter as well as spring and summer.

Persons of any age may enter this competition. The limit is five photos per person, they must be *horizontal* views, and you must follow these other rules:

1. Contest is restricted to unpublished color transparencies taken by Louisiana residents. State employees are eligible to enter, but, by law, are not allowed to be paid.
2. Only 35mm color slides and transparencies up to 4x5 inches will be accepted. All photos must be submitted in standard mounts. No prints will be considered.
3. Slides must carry the photographer's name, address and daytime phone number on the mount. You may title the slide if you wish. Each entry must be protected by a standard protective covering, and the entire package must be labeled with the photographer's name and address.

PLEASE NOTE: Print everything clearly. Enclose return postage. We will do our best to return your photos if they are not used but cannot be responsible for any damage or loss.

4. Winners will be notified by telephone by June 1.
5. Send entries to: Photo Contest, Louisiana Conservationist, P.O. Box 98000, Baton Rouge, LA 70898-9000.

Deadline: May 1, 1989

What Kinda Rig You Got?

FUNNY SIDE UP

BY GLYNN HARRIS

Drawing by David Norwood

How're you gonna keep 'em down on the farm, after they've seen Par-ee? goes the lyrics of an old tune. That line can sort of explain why my battered old fishing boat with which I had enjoyed a satisfying love affair for years began to lose its appeal when bass boat fever swept the country several years ago.

Although temptation tugged at me constantly, I managed to stay "down on the farm" with my old clunker longer than most. I was never one to be in a hurry to latch onto any and every new fad that came along. I tend to stand back and watch for the right time before making my move.

Remember when those double-knit leisure suits were in vogue several years ago? I was the guy who waited until I was certain they were here to stay. When I was sure it was the right thing to do, I bought three of the leisure jobs only to watch men's fashions change before my eyes two weeks later. Now, three barely worn double knit suits leisurely gather dust in the far corner of my closet.

But no more will I hear guffaws, snickers and chortles when I glide up to the dock in my fishing boat. Why? Because I finally took the plunge and bought the sharpest looking, most up-to-date bass rig I could find.

I really did it for the sake of ego. It hurts to be sitting on the lake in an old boat with a little putt-putt on the back and have the guys in the big rigs roar by, regarding you in the same light as a floating beer can. My ego took such a beating, I would hit the lake before daybreak and stay gone until after dark so I wouldn't be seen. The crowning blow came one day, though, when I was in a group of hot-rod bassers who were talking rigs. All eyes turned in my direction and a hush fell on the group when a sneering bass boat jockey asked me sarcastically, "And what kinda rig you got?" I didn't know whether to outright lie, or to point at my throat, feigning laryngitis.

I found out the hard way that bass boat owners can be downright cruel — in a nice sort of way. Rather than make sport openly when the truth came out about my old boat, one basser dressed in a royal blue jump suit with white racing stripes and red stars, mirrored sun glasses, a cap with the visor twisted into a "Bill Dance" kink, and a toothpick jutting menacingly from between his teeth, whispered behind his hand to another, and a twitter of a giggle fluttered forth.

As I was wiping specks of dust from my new rig recently, I reflected on how far fishing has come in my lifetime. When I was a kid, anybody owning a little flat-bottomed cypress boat was somebody to be envied. And if he had an outboard mounted on back, even if he cranked it with a piece of plow line and roared away in a cloud of blue smoke with the sound of a cropduster and the speed of a turtle, he was really somebody.

The owner of the flat-bottomed job had his boat equipped with accessories not totally unlike that of the modern angler. If he needed a depth finder, he tied an old spark plug to a length of fishing line and lowered it to the bottom. In place of a trolling motor, he used a clever device, cylindrical on one end and flat on the other called a "paddle". His live well consisted of a burlap bag hanging over the side of the boat with the inscription "Acme Mule Feed" emblazoned thereon.

It matters not that I have caught a ton of fish out of my old boat. It doesn't amount to a hill of beans that I could wiggle it through tight spots and get to fishing areas a bass boat could never reach. So what if my monetary investment in the old boat was a mere pittance compared with the new rig.

What does matter is that now, I can gun it down the lake with the best of them, and when a group of bass-busters gathers, I can swagger up in my baby blue jumpsuit with racing stripes, glint steely-eyed through my mirrored Polaroids, thrust my toothpick at a jauntly angle and just hope like rip that somebody asks me: "And what kinda rig you got?"

Doesn't Like Paid Circulation

I am very disappointed in this move. I feel this is one of the first taxes that our new administration has imposed on the sportsmen of our great state. This great magazine has been self-supported for so many years. I use this magazine to bring tourists and advertise our state. I believe it is one of the best.

But, I will pay the fee under protest. I don't feel I am able to do without this great magazine. Thanks to all of the wonderful people that have been involved in the past years.

I would appreciate some response. My temporary address is below.

Chester J. Knott
Athens, AL

Before paid circulation, the Louisiana Conservationist was supported by general department monies. By going to paid circulation, we were able to free up approximately $500,000 annually to fund other activities of the department, wildlife management, habitat restoration, etc. As stated earlier, funds generated by the magazine will be used by the magazine and subscribers will be given an annual report on receipts and expenditures.

—Editor

Wants Info on Calendar

I have been curious about the success of your drive to get paid subscriptions for the Louisiana Conservationist. I want to thank you for the WL&F calendar. It is not only beautiful, but most informative to hunters and fishermen and has other valuable information. Will these calendars be mailed out with subscription renewal notices each year? If not, can they be purchased?

Request a reply, please.

A.J. Edwards, Jr.
Dubberly

The calendar has been one of the most well received issues we have ever done. It is our plan to annually make the July/August issue of Louisiana Conservationist a calendar. This way, all subscribers will automatically receive it. It will also be available for purchase separate from the magazine.

—Editor

Labels Falling Off

I have received the Conservationist for years, having lived in Louisiana for fifty, and still own property there.

However, I did not receive my copy of the January/February 1989 issue. My son C.M. Hutchins did and I am impressed with it after reading his. The reason for my not receiving it is that the labels do not have enough glue and slip off the very slick paper. I talked to the postmaster and he showed me a box of magazines with no labels, also containing loose, attached labels.

Thought you would like to know this as I am sure there are some disgruntled folks out there.

I have kept all issues and refer to them as do others.

Ethel M. Hutchins

We were overwhelmed with letters and phone calls informing us of this problem. A description of the problem and instructions for those who did not receive their January/February issue are included on the inside front cover of this issue.

— Editor

Uses Magazine in School

We are a K-12 school with approximately three hundred and fifty students. I find that children of all ages like to at least look at Louisiana Conservationist.

Our Louisiana history teacher uses the magazine in her class frequently. It is especially useful when studying the section on Louisiana resources.

Ada L. Savoie
Librarian
Reeves High School

Why Out-Of-State Printing?

First of all, many thanks and congratulations for producing such a first rate publication on and about our great state.

I fully realize that this is not the best forum to discuss Louisiana's economic problems, but based on this I have a question (that many people are asking) that I hope you will address in the Louisiana Conservationist.

Given our current state of affairs, why is Louisiana Conservationist printed out-of-state in states such as Tennessee, Ohio and Pennsylvania? Why is it not published and printed in our home state? Why is it not benefiting our state and our people, so many of whom are unfortunately unemployed?

Thank you for reading and hopefully for a response, if not in the Louisiana Conservationist, by a letter back to me.

Glenn Perrin
Harahan

The contract for printing of Louisiana Conservationist is governed by state statute and awarded by the Division of Administration. Printers within the state are given a five percent preference. In other words, for an out-of-state printer to win the bid, their bid must be more than five percent less than the lowest Louisiana bidder. For the last few years, a series of out-of-state printers have submitted the lowest bids and won the contract. This year, in fact, no one in Louisiana even submitted a bid quotation.

— Editor

LAW LINES

Behind the Badge

BY LT. KEITH LaCAZE

With the 1989 turkey season under way March 11-April 30, I will devote this space to the Ten Commandments for Turkey Hunting. They originate with Don Garver, a biologist for the State of Illinois.

We have had a number of accidental shootings during past turkey seasons. These Ten Commandments are good safety rules and might even make you a better turkey hunter:

1. Don't ever attempt to approach closer than 100 yards to a hen or gobbler. The "turkey" you hear may be another hunter. If you haven't mastered the skills necessary to call in your bird, you don't really deserve him.

2. Never select a calling site with your back to a tree that is smaller than the width of your shoulders. Small trees won't hide the slight movements of your hands and shoulders when you are operating a call, and you could look like a turkey to another hunter. Use a wide tree to protect your back, where you can't see.

3. Never jump and turn suddenly because you hear a turkey close behind you. The turkey behind you could be another hunter on the verge of shooting what he believes is a bird. Wait until the bird walks where you can see it, or call it back later.

4. Never select a calling site where you can't see at least 40 yards in all directions. A good turkey caller will often bring in unskilled hunters. If you are just below the edge of a sharp ridge, another hunter may come over the top ready to open up. Don't invite surprises. Be able to see what is going on around you.

5. Never stalk a turkey. Stalking is both unethical and dangerous to yourself and other hunters. The idea is to call the bird to you.

If you feel that moving your stand will give you a better chance at a gobbler, always move away from the bird, never toward it. If it is a gobbler and you move toward it, it will probably see you, and if it is another hunter, you are inviting an accidental shooting.

6. Don't use a gobbler call. When you shake a gobbler call, your hand can look like a gobbler's head, and the call itself is sure to get the attention of every hunter in the area. It's safer and usually more productive to stick with the hen call.

7. Don't think because you're fully camouflaged that you're totally invisible. When you move even slightly, you are plenty visible to both turkeys and hunters. Sitting perfectly still will kill more turkeys than all the camouflage in the world, and sitting still won't get you shot.

8. Never wear red, white or blue clothing, not even undergarments of those colors. Red is the color many hunters use to differentiate a gobbler's (red) wattles from a hen's (blue) head. White will look like the snowball-colored head of a gobbler, and blue is the color of a hen's head—which an unethical hunter may attempt to shoot.

9. Never presume that what you hear or what answers you is a turkey. The better you learn to use a hen call, the more unskilled hunters you will attract, and some ignorant ones will attempt to stalk you.

10. Don't try to hide so well that you can't see what's happening. You can't kill a turkey that you can't see, and if you call in another hunter, you both want to know about it.

If you don't move, you can call a gobbler to within a few feet of yourself in open woods, and, besides, gobblers don't like dense bushy areas that could be concealing predators.

Manitoba Was Never Like This: That's the gist of what Micheal Labossiere (right) told Sgt. Erroll Campbell of the Enforcement Division of the Louisiana Department of Wildlife and Fisheries. Labossiere, a conservation officer from Canada's Manitoba Province, visited Louisiana on an exchange program sponsored by the North American Wildlife Enforcement Officers Association. Campbell and other LDWF agents introduced him to wildlife, terrain and Cajun cuisine the likes of which he'd never seen.

Conservation Notes

Bert Jones Joins Board

Former football star Bert Jones brings a background of active service in behalf of wildlife and conservation to his new post on the Louisiana Wildlife and Fisheries Commission.

Jones, a resident of Ruston, was appointed by Gov. Buddy Roemer to a six-year term on the commission, succeeding Dr. Jack T. Cappel Jr., of Alexandria, whose term expired.

Now a businessman, Jones retired from professional football in 1982 after a brilliant 10-year career at quarterback. Since then, he has become widely known as an environmental campaigner.

Jones is one of the originators of the Louisiana Clean Team, which focuses on the state's litter problem and other environmental issues. He has volunteered his services in making television commercials for the Department of Wildlife and Fisheries and Operation Game Thief.

He owns 500 acres near his home and leases additional land, and works in cooperation with department biologists to enhance these parcels as habitat for wildlife.

Jones is an enthusiastic turkey hunter, fisherman and outdoors photographer. He is married and has four children. Holder of a bachelor's degree in general business from Louisiana State University, he heads Mid-States Wood Preservers, a Simsboro lumber-treating firm.

Jones played football with the LSU Tigers in 1969-73 and later with the Baltimore Colts and the Los Angeles Rams. He was named Most Valuable Player in the National Football League in 1976.

Wetlands Fund Is Born

The Louisiana Duck Stamp Fund, a program created by the 1988 Legislature to provide funding for wetlands preservation, has officially received its first deposit.

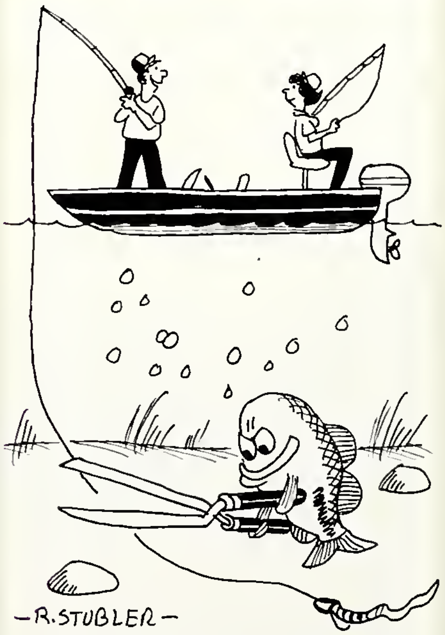
Dave Morrison, program coordinator for the Department of Wildlife and Fisheries, said the first deposit of $2,250 came from the $50 entry fee paid by 45 participants in the recent competition to choose artwork for the initial Louisiana duck stamp due out for the 1989-90 hunting season.

"Revenue generated from the long-awaited Louisiana first-of-state duck stamp and associated art print is expected to top $1 million the initial year, and will enable the department to initiate badly needed wetland acquisition projects in Louisiana," he said.

Morrison emphasized, however, that revenue generated by the program in subsequent years is expected to be significantly less than the first year. He attributed the higher revenue the first year of the stamp program to the demand from collectors for first-of-state stamps and prints.

"Even at $1 million a year, this alone does not approach the amount of money necessary for desperately needed wetland projects," he said. "That is why we are also appealing to concerned Louisianans to bolster the wetland acquisition fund through private contributions."

Morrison said no contribution is too small and pledged that all donations received will go exclusively to wetland acquisition and enhancement.



"I think I got a hit. The line went slack"

He said checks should be made payable to the Louisiana Department of Wildlife and Fisheries Duck Stamp Fund (LDWF-Duck Stamp Fund) and sent to his attention at P.O. Box 98000, Baton Rouge, LA 70898-9000.

Book on Waterfowling

A comprehensive new manual on duck and goose hunting has been published by the National Rifle Association.

Another volume in the NRA Hunter Skills Series, "Waterfowl Hunting" covers such aspects of the sport as gear selection, hunting tactics, shotgun shooting, safety, bird identification and waterfowl management.

The paperback book, containing 300 pages and 150 illustrations, is available for $5 plus $1.50 shipping from NRA Sales Department, P.O. Box 96031, Washington, DC 20090-6031.

New Wildlife Refuge

The 9,621-acre Cameron Prairie in Cameron Parish has become the 447th national wildlife refuge under the egis of the U.S. Fish and Wildlife Service.

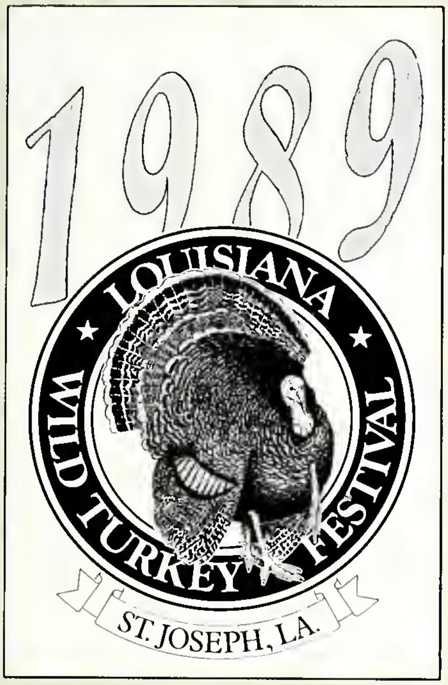
Located about 15 miles southeast of Lake Charles, Cameron Prairie National Wildlife Refuge is bisected by LA-27 and bounded on the south by the Intracoastal Waterway. The site was acquired by USFWS from Hebert-Helms Co. and Trahan Land Co.

Cameron Prairie is the first new refuge established under the Gulf Coast Joint Venture of the North American Waterfowl Management Plan. Joint Ventures are cooperative efforts by federal and state agencies, conservation organizations and private citizens.

The area will serve as a wintering habitat for mallards, pintails and other waterfowl, but wading birds also will benefit.

Species known to occur on the tract include herons, egrets, bitterns, ibises and roseate spoonbills. Shorebirds and waterbirds such as the common moorhen, purple gallinule, black-necked stilt, killdeer, king rail, cormorant and anhinga also abide in great numbers.

In addition, the endangered peregrine falcon and the wood stork are known to use the area.



Tensas Turkey Festival

The Louisiana Wild Turkey Federation will hold its first annual Louisiana Wild Turkey Festival on Saturday, March 11, in the Tensas Parish town of St. Joseph.

Events will be continuous from 9 a.m. to 5 p.m., said Mike Grace, festival chairman. They will include an arts and crafts fair, calling contests, a turkey shoot, an archery competition for adults and children, and a BB shoot for children.

Information may be obtained from the St. Joseph Mayor's Office, 318/766-3713.

Poachers Get Jail Terms

Prison terms and a tongue-lashing were administered in Federal Court to four St. James Parish men who slaughtered 667 grosbecs, a protected species, according to Col. Winton Vidrine, chief of enforcement for the Louisiana Department of Wildlife and Fisheries.

The four, all residents of Vacherie, were Lawrence J. Folse Sr., 38; his brother, Royley A. Folse Jr., 43; Eunice Dumas, 50; and Edward J. Rodrigue, 42.

All had pleaded guilty. The Folses were sentenced to four months in prison, and Dumas and Rodrigue to two months. Each was also fined $500 and ordered to perform 312 hours of community service.

In passing sentence in New Orleans, Judge George Arceneaux rebuked the defendants for the "senseless and wasteful slaughter" of the protected birds, also known as yellow-crowned night herons.

"We all grew up when game was plentiful in Louisiana," said Arceneaux, "but if our grandchildren and our grandchildren's children are to enjoy the bounty we enjoyed, we have to change past attitudes.

"Slaughter for the sake of slaughter must stop!"

The four men were nabbed last May 24 by two LDWF enforcement agents, Capt. Ted Adams and Lt. Donnie Miculek. The agents reported that the bird killings took place May 22 and May 24 in a swamp near St. James in St. James Parish.

In a separate case involving the illegal sale of alligator parts, Royley Folse was sentenced by a U.S. magistrate to serve an additional two months in jail.

Carvers Festival Set

The Louisiana Wildfowl Carvers and Collectors Guild will hold its 15th annual show and competition Sept. 30-Oct. 2 at the University of New Orleans.

Charles W. Frank, chairman of Wildfowl Carvers Festival 1989, expects the exhibition to attract some 10,000 viewers. He said more than $20,000 in cash awards would be offered to competing carvers and painters of wildlife.

A Line on the Weather

Detailed weather reports are available to Louisiana outdoorsmen on their home computers, thanks to a service being marketed by a Lafayette firm.

The company says that hunters, fishermen and campers can pinpoint the exact area on land or in the Gulf of Mexico that they intend to visit, and get the latest outlook on weather conditions there.

What's needed is any IBM-PC or PC compatible home computer with color graphics board a nd a 1200 baud modem.

Information about the Weatherstar system may be obtained from Ed Roy, Ltd., 1120-C Coolidge Blvd., Lafayette, LA 70503.

Commercial Gear Reminder

Commercial fishermen are reminded by the Louisiana Department of Wildlife and Fisheries that a new law requires them to buy one or more licenses for so-called miscellaneous fishing gear.

The 1988 Legislature specified a $25 license fee for miscellaneous gear used by commercial fishermen in addition to such conventional categories as nets, trawls and traps already requiring licenses.

Miscellaneous gear employed by commercial fishermen for special purposes generally falls into four classifications: Containers such as pipes, buckets or cans; set lines such as trot lines, long lines and bush lines; minnow traps; and eel pots.

Under the new law, which went into effect Jan. 1, each of the four types of miscellaneous gear needs a separate license. However, a single license covers any legal number of gear items within each of the four classifications.

The miscellaneous-gear license requirement is contained in Act 825 of the last Legislature as an amendment to RS 56:305.

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Bayou Kitchen

Photograph by Ken Glaser

Bass With Asparagus and Garlic Mayonnaise

Bass fillets
Salt and pepper
Flour
Butter/olive oil
Steam asparagus

Wash fish, salt and pepper the pieces and roll them in flour. Saute in butter and olive oil. Cook fish until brown. Arrange warm steamed asparagus on the hot fish and top with garlic mayonnaise. Serve immediately.

Garlic Mayonnaise

3 egg yolks, room temperature
3 tbsps. (or more) fresh lemon juice
3 garlic cloves
1 tbsp. Dijon mustard
3/4 tsp. salt
1 cup corn oil or other vegetable oil
2/3 cup olive oil
Freshly ground pepper

Blend yolks, 3 tbsps. lemon juice, garlic, mustard and salt in food processor. With machine running, gradually add oils through feed tube in very slow steady stream and process until thickened. Season generously with pepper.

Makes about two cups.

Shrimp and Cauliflower Salad

2 1/2 lbs. med. shrimp, in shell
1 med. head cauliflower (2 lbs.)
1 cup mayonnaise (homemade is best)
1 cup (1/2 pt.) plain yogurt
1/3 cup Creole mustard
6 tbsps. chopped fresh dill
1 cucumber, scored and thinly sliced for garnish
1 large carrot, peeled and shredded for garnish

Bring large pot salted water to boil. Add shrimp and cook, uncovered, until pink and slightly firm to the touch (about 1-2 minutes). Pour into colander and rinse under cold water to stop the cooking; drain well. Shell the shrimp, devein, cover and refrigerate. Cut cauliflower into 1-inch florets. Add to shrimp. In a small bowl, combine mayonnaise, yogurt, mustard and dill; blend well. Add to shrimp and cauliflower; toss well. Refrigerate for at least 2 hours or overnight. Arrange the cucumber slices decoratively around the salad on individual plates (or a serving dish) and garnish with the shredded carrots. Makes 10-12 salad servings, 6-8 main course servings.

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